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DEPARTMENT OF THE INTERIOR

HUBERT WORK, Secretary

BUREAU OF RECLAMATION

DAVID W. DAVIS, Commissioner

HIGH-PRESSURE RESERVOIR OUTLETS

A REPORT ON
BUREAU OF RECLAMATION INSTALLATIONS

By

J. M. GAYLORD, Electrical Engineer

AND

J. L. SAVAGE, Designing Engineer

PART 2 DETAIL DRAWINGS



WASHINGTON
GOVERNMENT PRINTING OFFICE
1923

NOTICE

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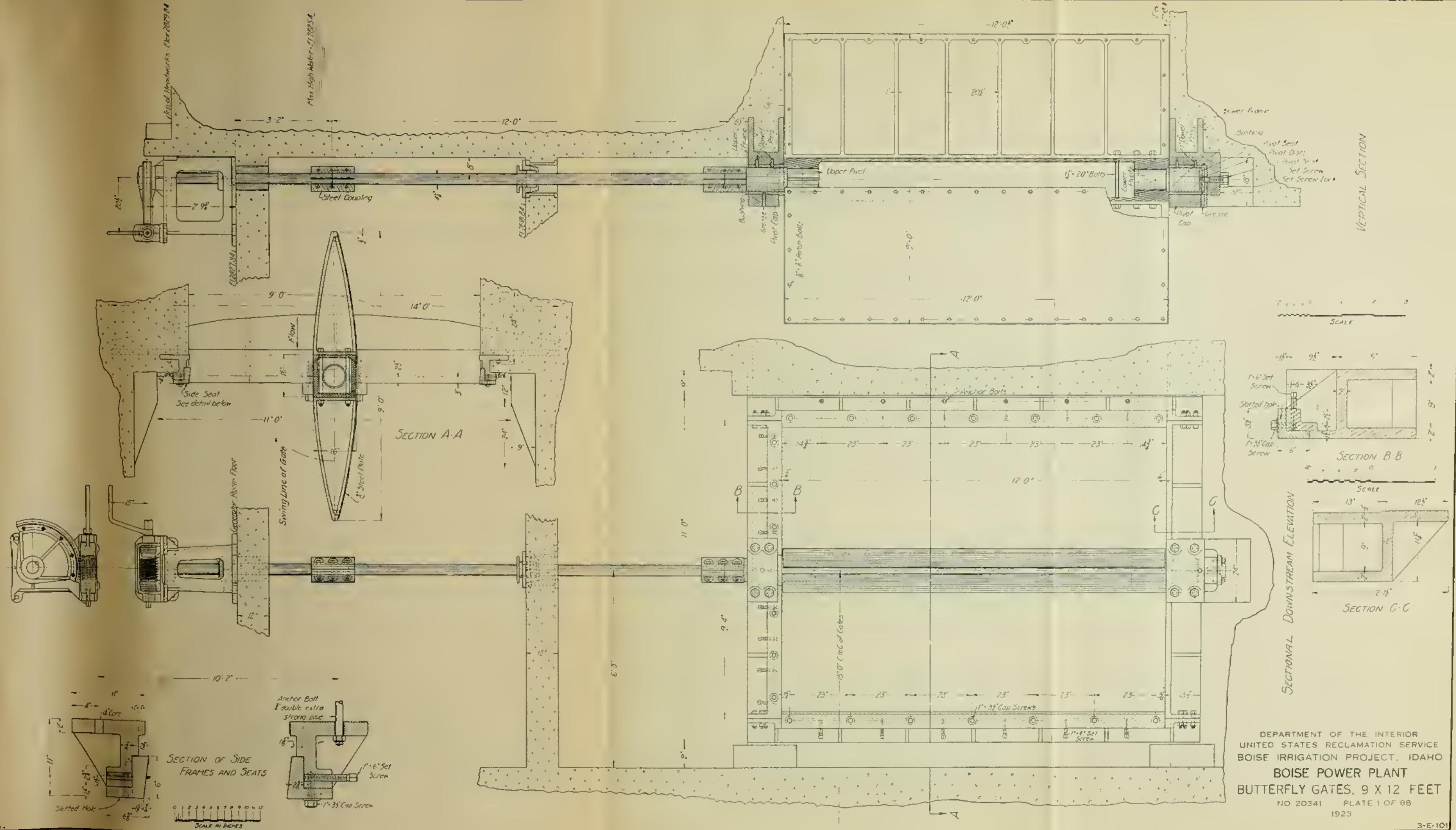
GENERAL.

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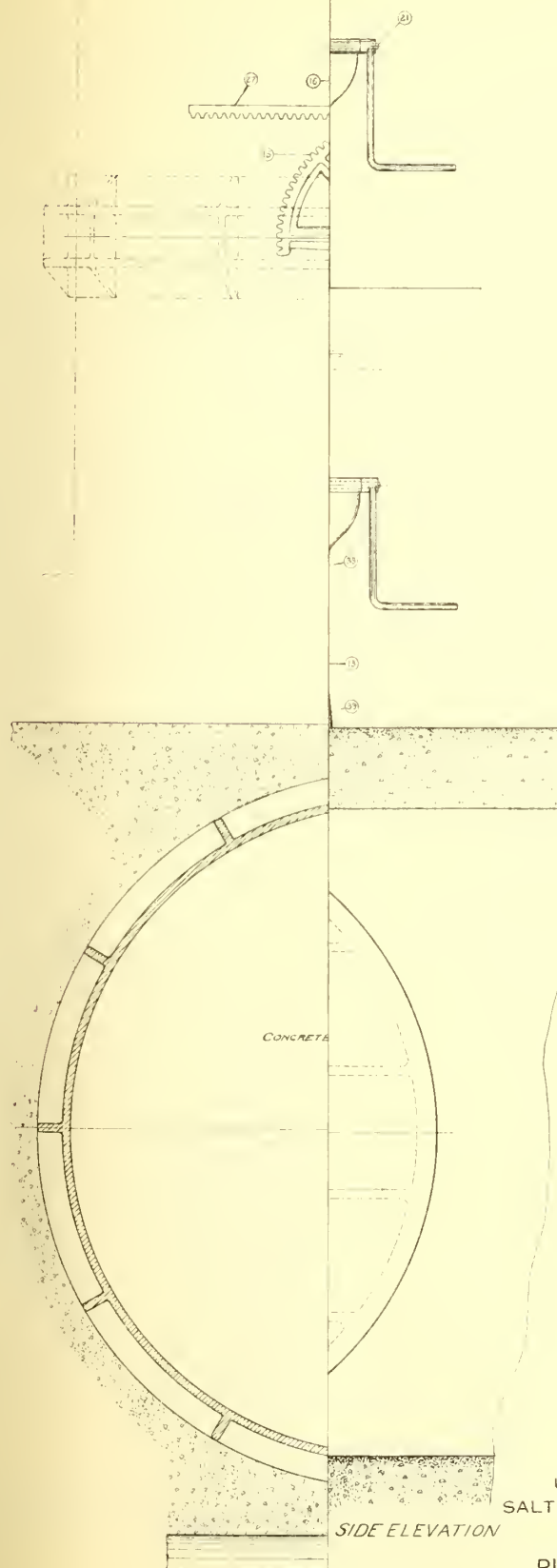
11-11-46 Belle Fourche & Mc Strawberry Reservoir







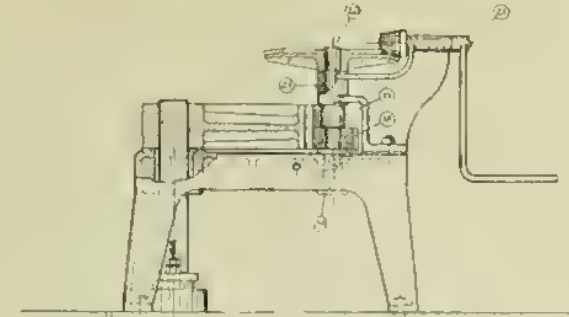
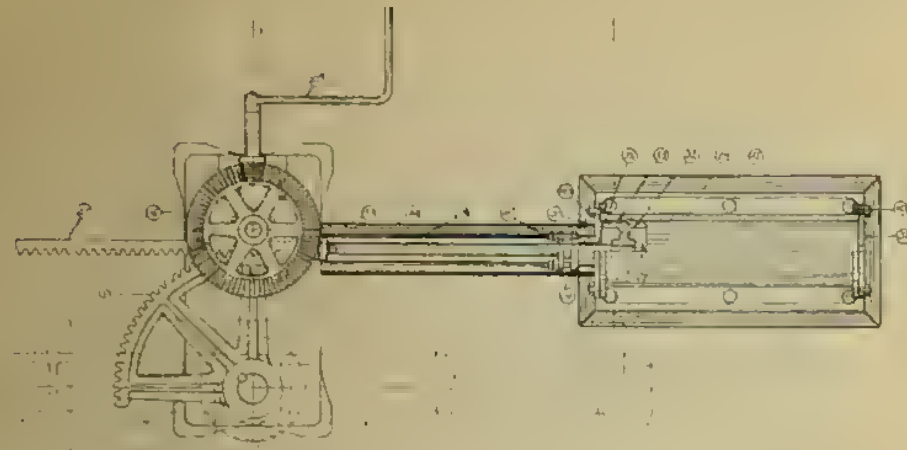
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BOISE IRRIGATION PROJECT, IDAHO
BOISE POWER PLANT
BUTTERFLY GATES, 9 X 12 FEET
NO 20341 PLATE 1 OF 88
1923



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZONA

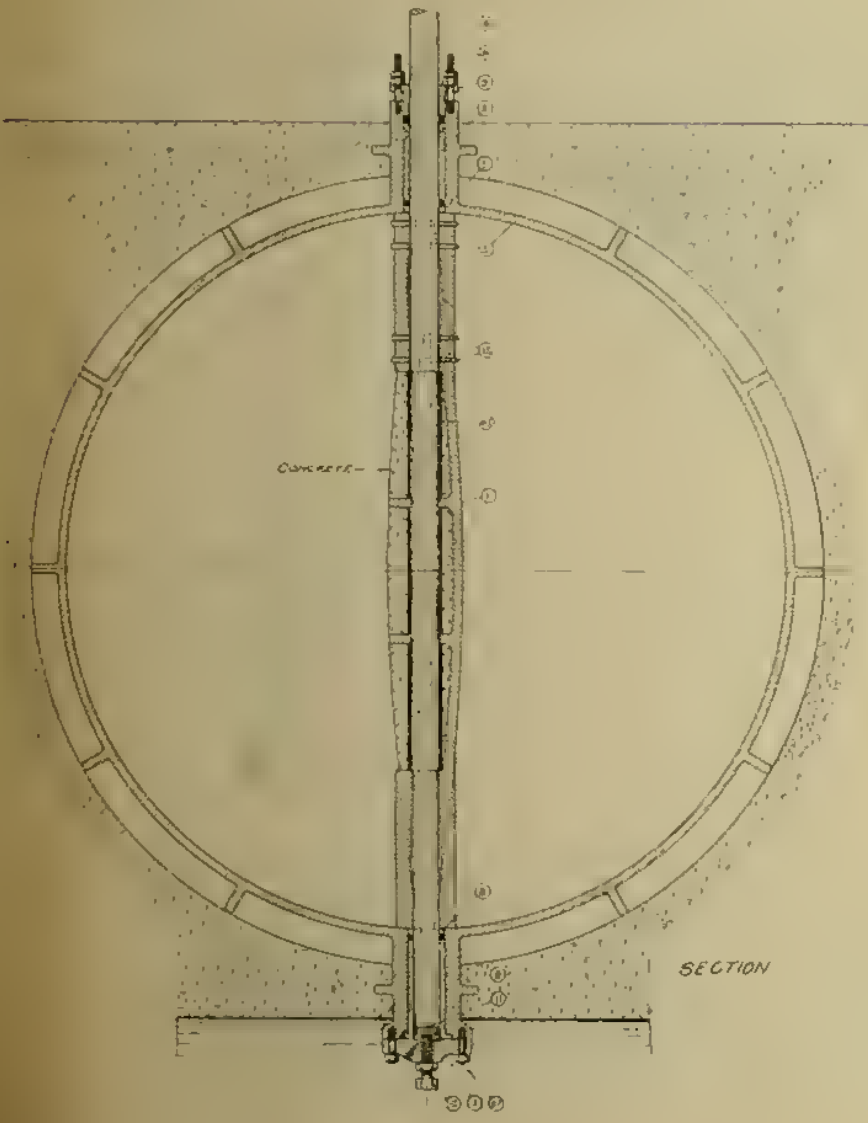
CROSS CUT POWER PLANT
BUTTERFLY GATES, 8 FT. DIAMETER

20342 PLATE 2 OF 88
1923

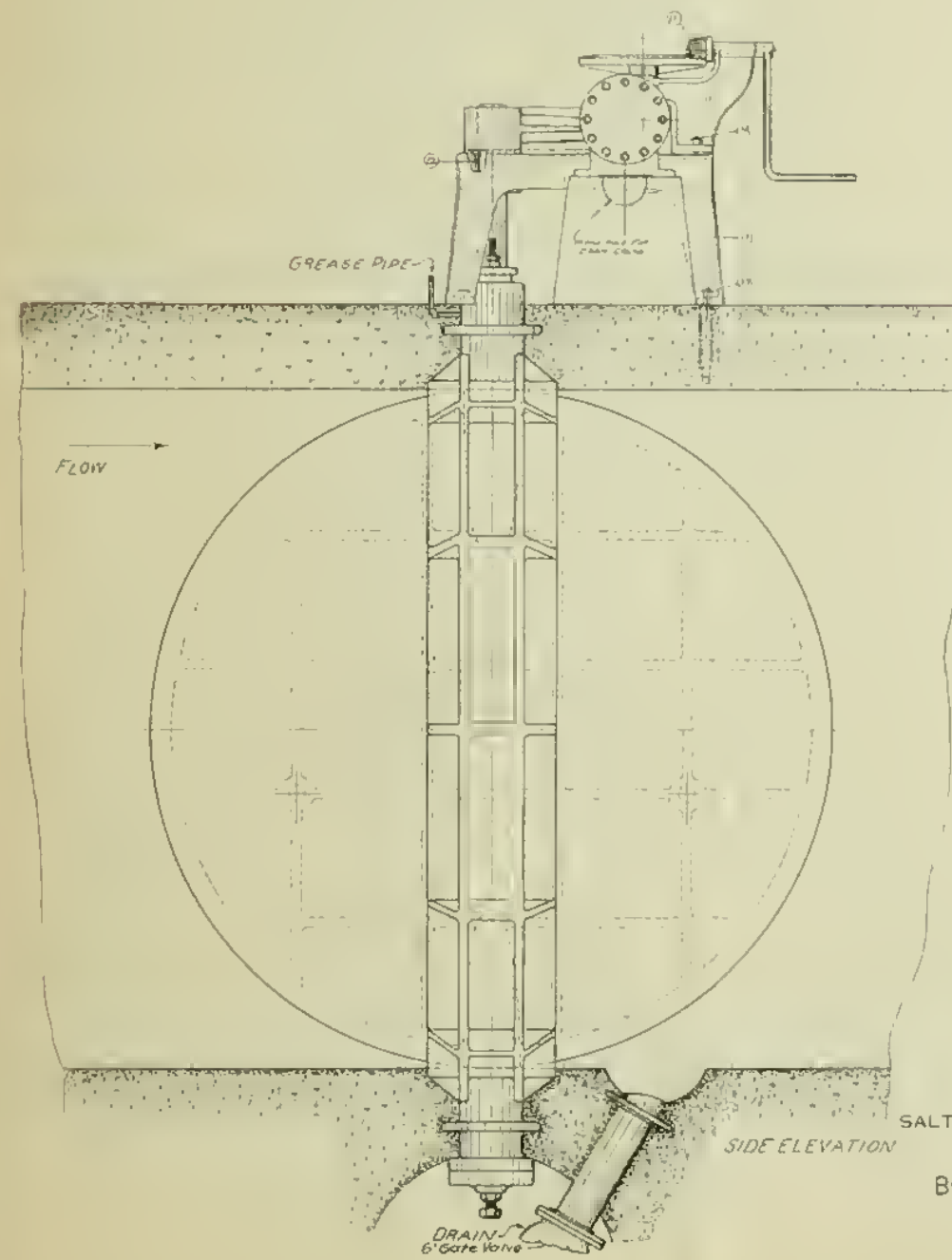


SECTION

PLAN VIEW

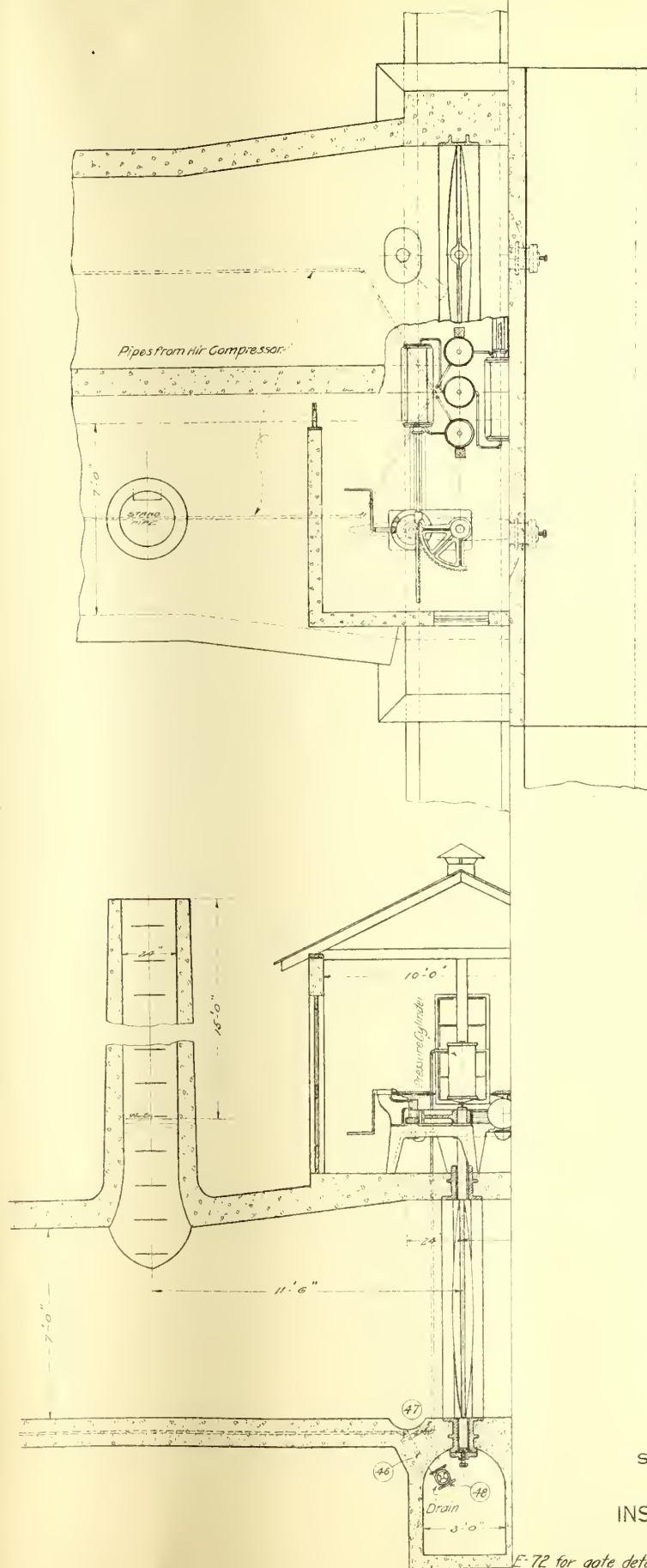


SECTION



SIDE ELEVATION

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZONA
CROSS CUT POWER PLANT
BUTTERFLY GATES, 8 FT. DIAMETER
20342 PLATE 2 OF 88
1923



SECTION "A-A"

LIST OF MATERIAL FOR ONE GATE

NO.	SYMBOL	MATERIAL	NAME OF PART
1	(1)	CAST IRON	GATE LEAF
1	(2)	"	GATE FRAME
1	(3)	"	THRUST BEARING CAP
1	(4)	BRONZE	GATE SHAFT
1	(5)	"	TOP BUSHING
1	(6)	"	BOTTOM BUSHING (+1 AM)
1	(7)	"	TOP RING
1	(8)	"	BOTTOM RING
1	(9)	"	STUFFING BOX GLAND
1	(10)	"	ADJUSTING SCREW
3	(11)	MACH STEEL	THRUST BEARING DISCS
4	(12)	BRONZE	TAPER PINS
1	(13)	CAST IRON	GEAR STAND
1	(14)	"	GEAR STAND BRACKET
1	(15)	"	GEAR QUADRANT + (GIB HEAD KEY)
1	(16)	"	BEVEL GEAR + (GIB HEAD KEY)
1	(17)	BRONZE	BEVEL PINION (LEATHY SET SCREW)
1	(18)	"	SPUR PINION + (LEATHY KEY)
1	(19)	MACH STEEL	ROLLER
1	(20)	"	BEVEL GEAR SHAFT
1	(21)	"	BEVEL PINION SHAFT
1	(22)	BRONZE	GATE SHAFT BUSHING
1	(23)	"	BEVEL GEAR SHAFT BUSHING (UPPER)
1	(24)	"	" (LOWER)
1	(25)	STEEL FORGING	CRANK
1	(27)	MACH STEEL	RACK
1	(28)	"	PISTON ROD
1	(29)	CAST IRON	CYLINDER
1	(30)	"	CYLINDER HEAD + STUFFING BOX
1	(31)	"	CYLINDER HEAD
1	(32)	"	PISTON
4	(33)	"	PISTON RINGS
1	(34)	BRONZE	STUFFING BOX GLAND
1	(35)	"	STUFFING BOX SEAT
2	(36)	MACH STEEL	STUFFING BOX STUDS
8	(37)	"	THRUST BEARING CAP STUDS
2	(38)	"	GEAR STAND BRACKET STUDS
4	(39)	MILD STEEL	GEAR STAND ANCHOR BOLTS
24	(40)	MACH STEEL	CYLINDER HEAD STUDS
2	(41)	"	STUFFING BOX STUDS
6	(42)	MILD STEEL	CYLINDER ANCHOR BOLTS
2	(43)	"	STAY BOLTS
2	(44)	"	PIPE SEPARATOR
3	(45)	"	PIPE SLEEVE
1	(46)	CAST IRON	6" DRAIN PIPE 18' LONG
1	(47)	"	6" X 10" FLOOR FLANGE
1	(48)	"	6" GATE VALVE
2	(49)	BRASS	1/4" DRAIN COCKS

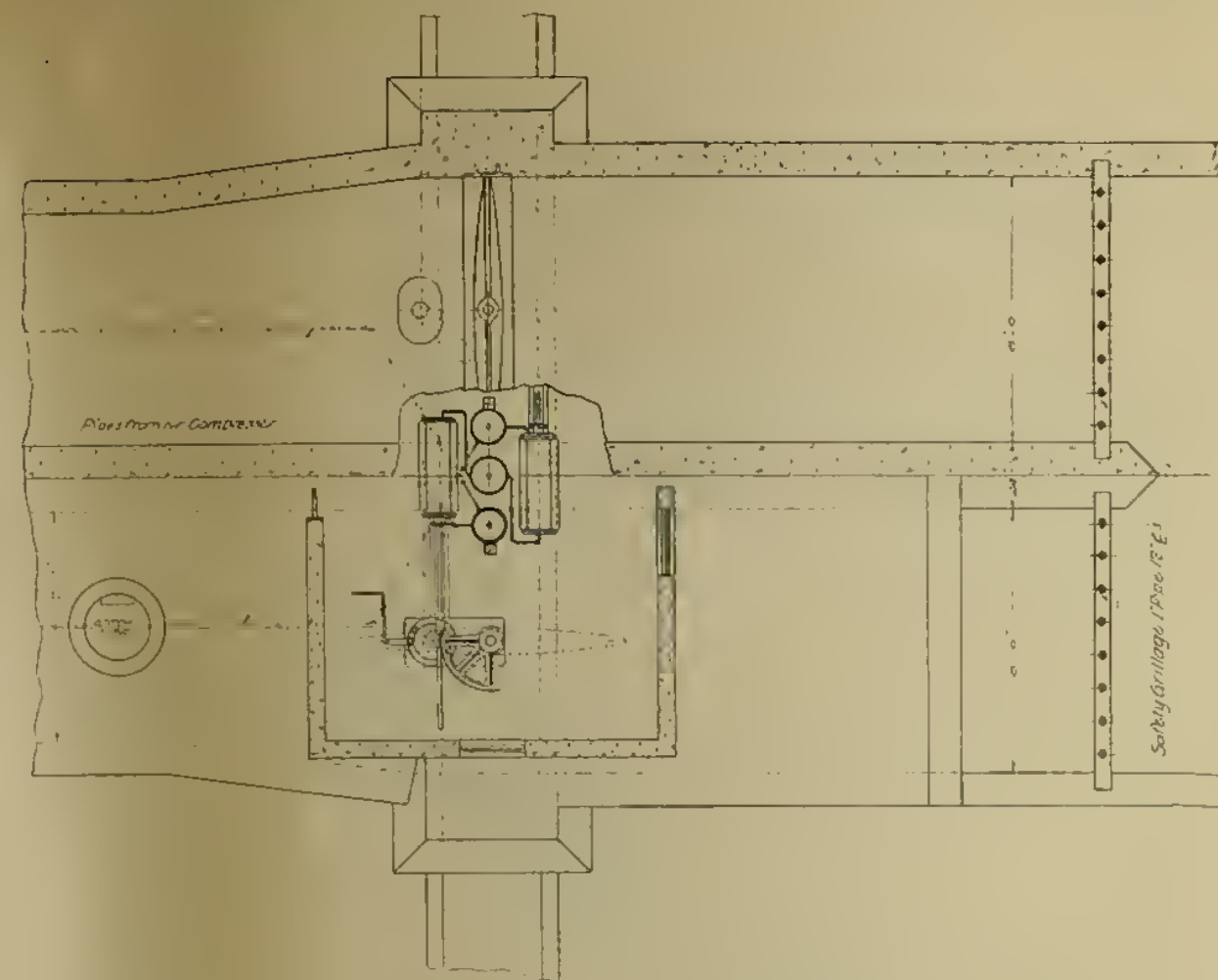
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZONA
CROSS CUT POWER PLANT
INSTALLATION 8 FT. BUTTERFLY HEAD GATE

NO. 20343 PLATE 3 OF 88

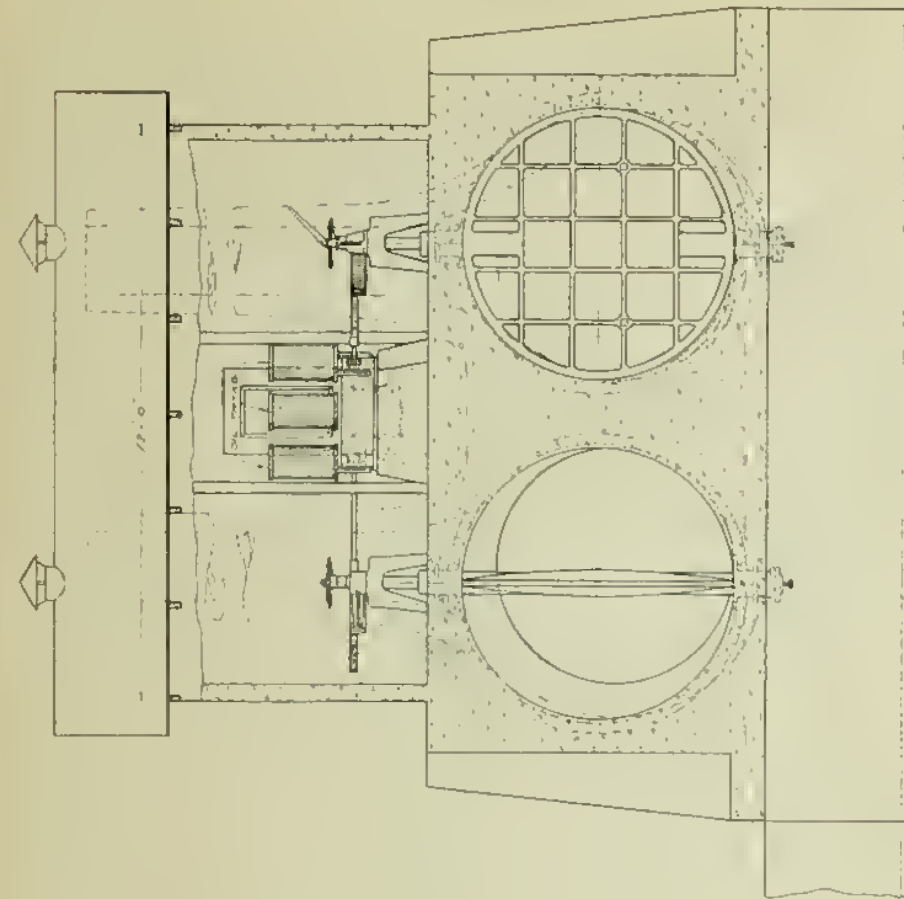
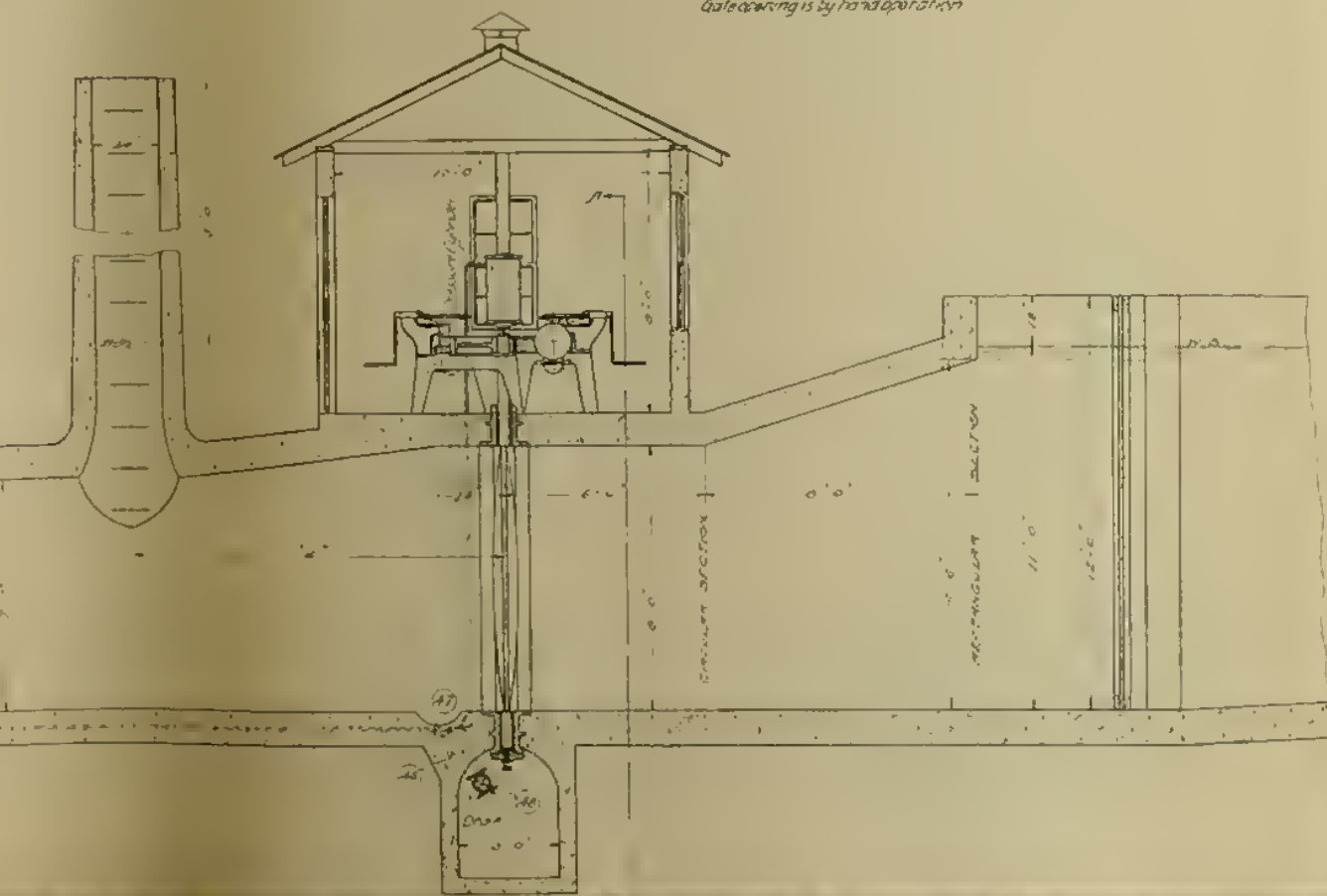
1923

F-72 for gate details

25-E-68



Gate operation by compressed air arranged re-closure only
Gate opening is by hand operation



SECTION A-A

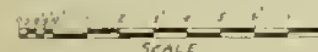
LIST OF MATERIAL FOR ONE GATE

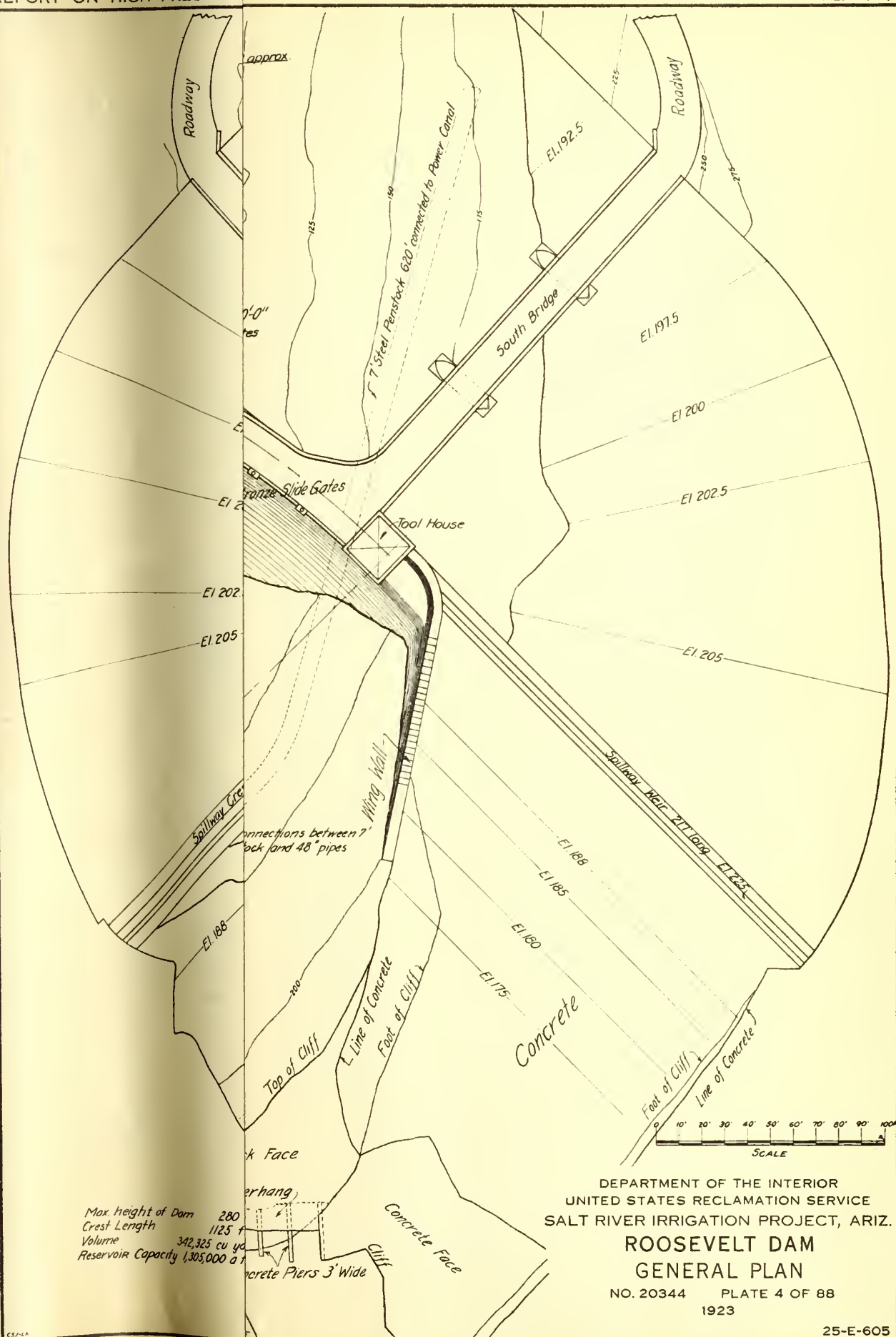
NO	QTY	MATERIAL	NAME OF PART
1	1	CAST IRON	GATE LEAF
1	2	-	GATE FRAME
1	3	-	THRUST BEARING CAP
1	4	BRONZE	GATE SHAFT
1	5	-	TOP BUSHING
1	6	-	BOTTOM BUSHING (1/2" DIA)
1	7	-	TOP RING
1	8	-	BOTTOM RING
1	9	-	STUFFING BOX GLAND
1	10	-	ADJUSTING SCREW
3	11	MACH STEEL	THRUST BEARING DISCS
4	12	BRONZE	TAPER PINS
1	13	CAST IRON	GEAR STAND
1	14	-	GEAR STAND BRACKET
1	15	-	GEAR QUADRANT (1/2" DIA KEY)
1	16	-	BEVEL GEAR 1 (1/2" DIA KEY)
1	17	BRONZE	BEVEL PINION (1/2" DIA KEY)
1	18	-	SPUR PINION (1/2" DIA KEY)
1	19	MACH STEEL	ROLLER
1	20	-	BEVEL GEAR SHAFT
1	21	-	BEVEL PINION SHAFT
1	22	BRONZE	GATE SHAFT BUSHING
1	23	-	BEVEL GEAR SHAFT BUSHING (INNER)
1	24	-	(LOWER)
1	25	STEEL FORGE	CRANK
1	26	MACH STEEL	CRANK
1	27	-	PISTON ROD
1	28	CAST IRON	CYLINDER
1	29	-	CYLINDER HEAD & STUFFING BOX
1	30	-	CYLINDER HEAD
1	31	-	PISTON
4	32	-	PISTON RINGS
1	33	BRONZE	STUFFING BOX GLAND
1	34	-	STUFFING BOX SEAT
2	35	MACH STEEL	STUFFING BOX STUDS
8	36	-	THRUST BEARING CAP STUDS
2	37	-	GEAR STAND BRACKET STUDS
1	38	MILD STEEL	GEAR STAND ANCHOR BOLTS
24	39	MACH STEEL	CYLINDER HEAD STUDS
2	40	-	STUFFING BOX STUDS
6	41	MILD STEEL	CYLINDER ANCHOR BOLTS
2	42	-	STAY BOLTS
2	43	-	PIPE SEPARATOR
3	44	-	PIPE SLEEVE
1	45	CAST IRON	6" DRAIN PIPE 18" LONG
1	46	-	6" X 10" FLOOR FLANGE
1	47	-	6" GATE VALVE
2	48	BRASS	24" DRAIN COCKS

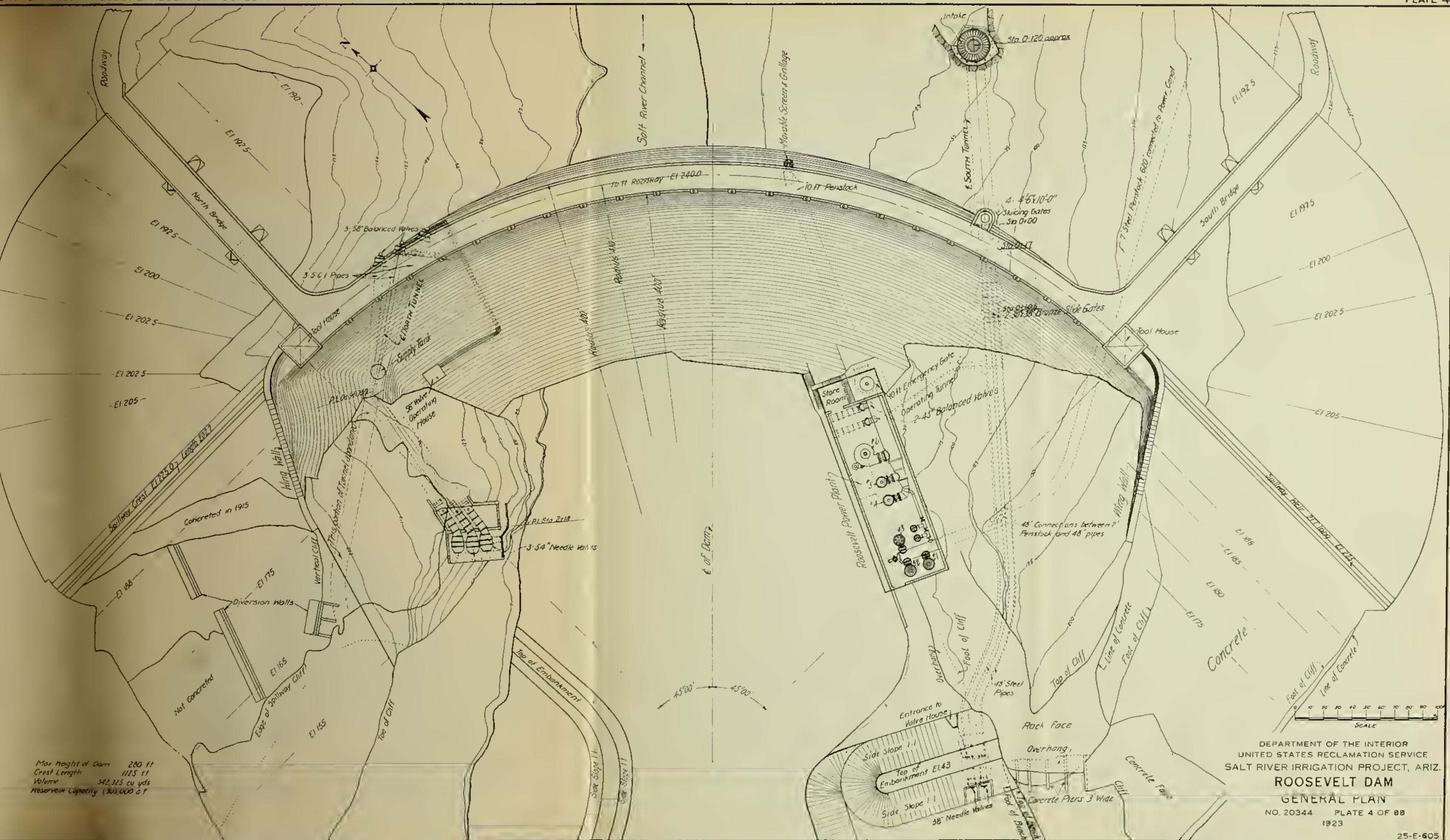
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZONA
CROSS CUT POWER PLANT
INSTALLATION 8 FT. BUTTERFLY HEAD GATE

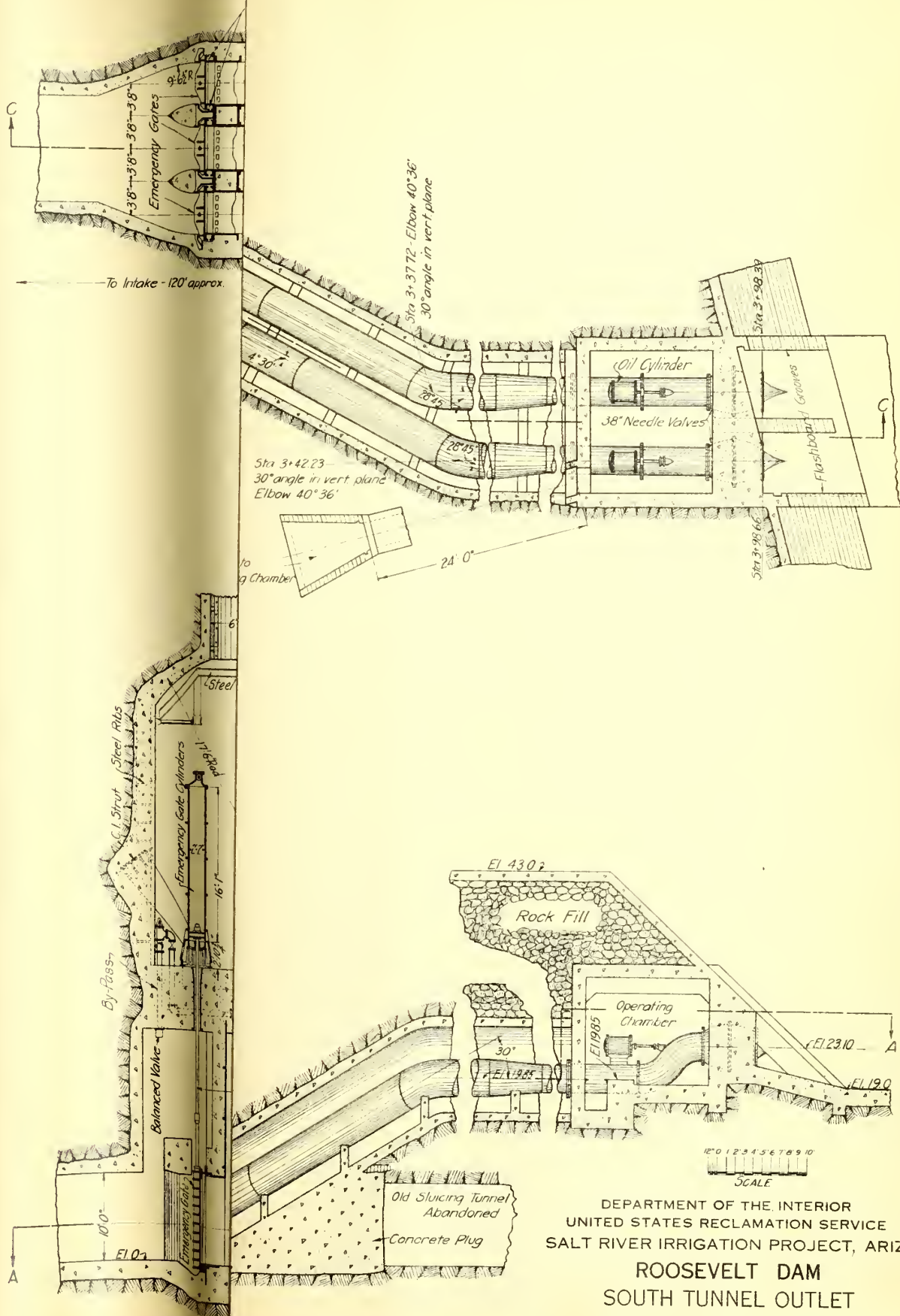
NO 20343 PLATE 3 OF 88
1923

See Dring 25-E-72 for gate details









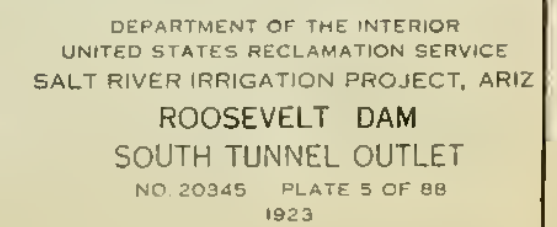
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZ.

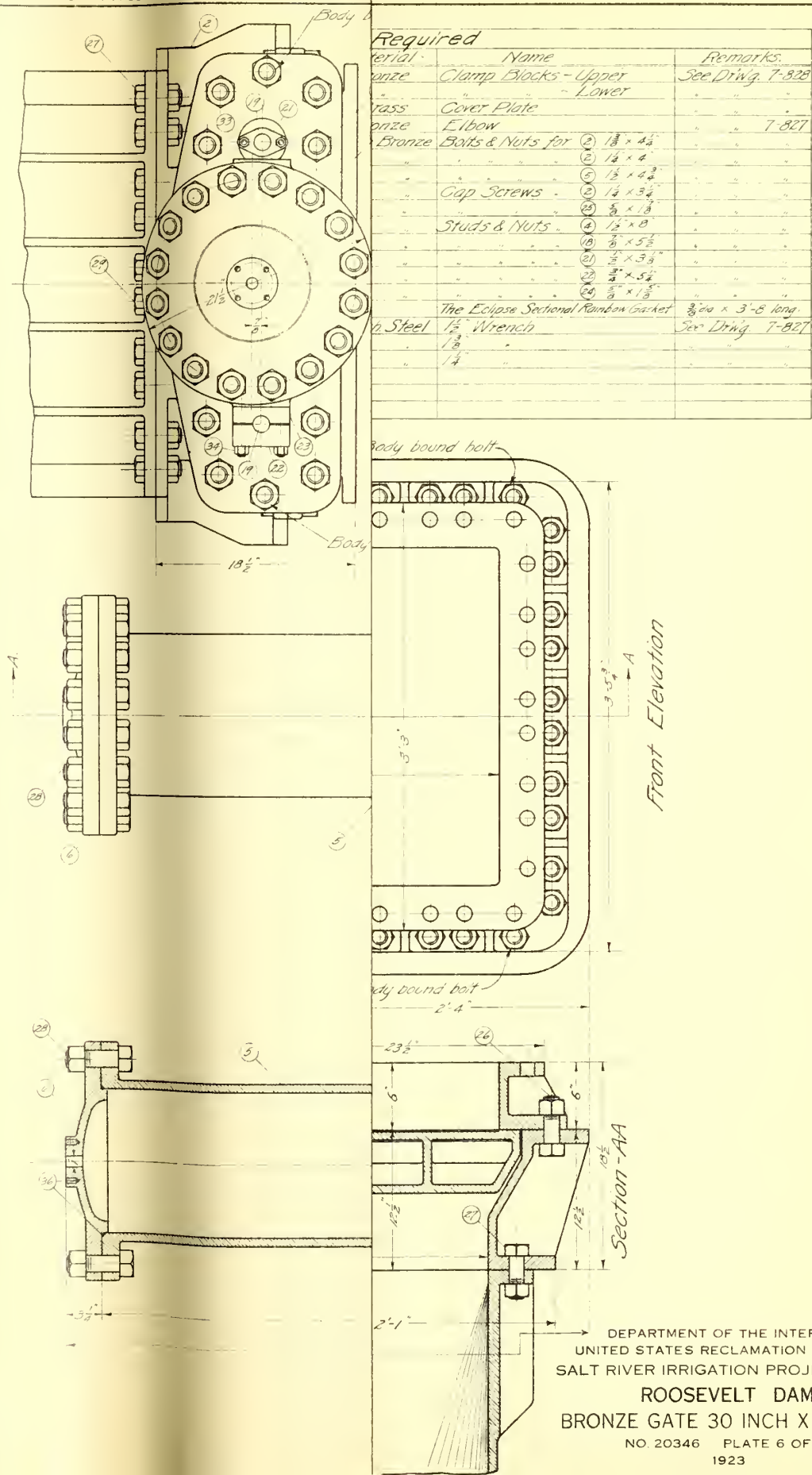
ROOSEVELT DAM
SOUTH TUNNEL OUTLET

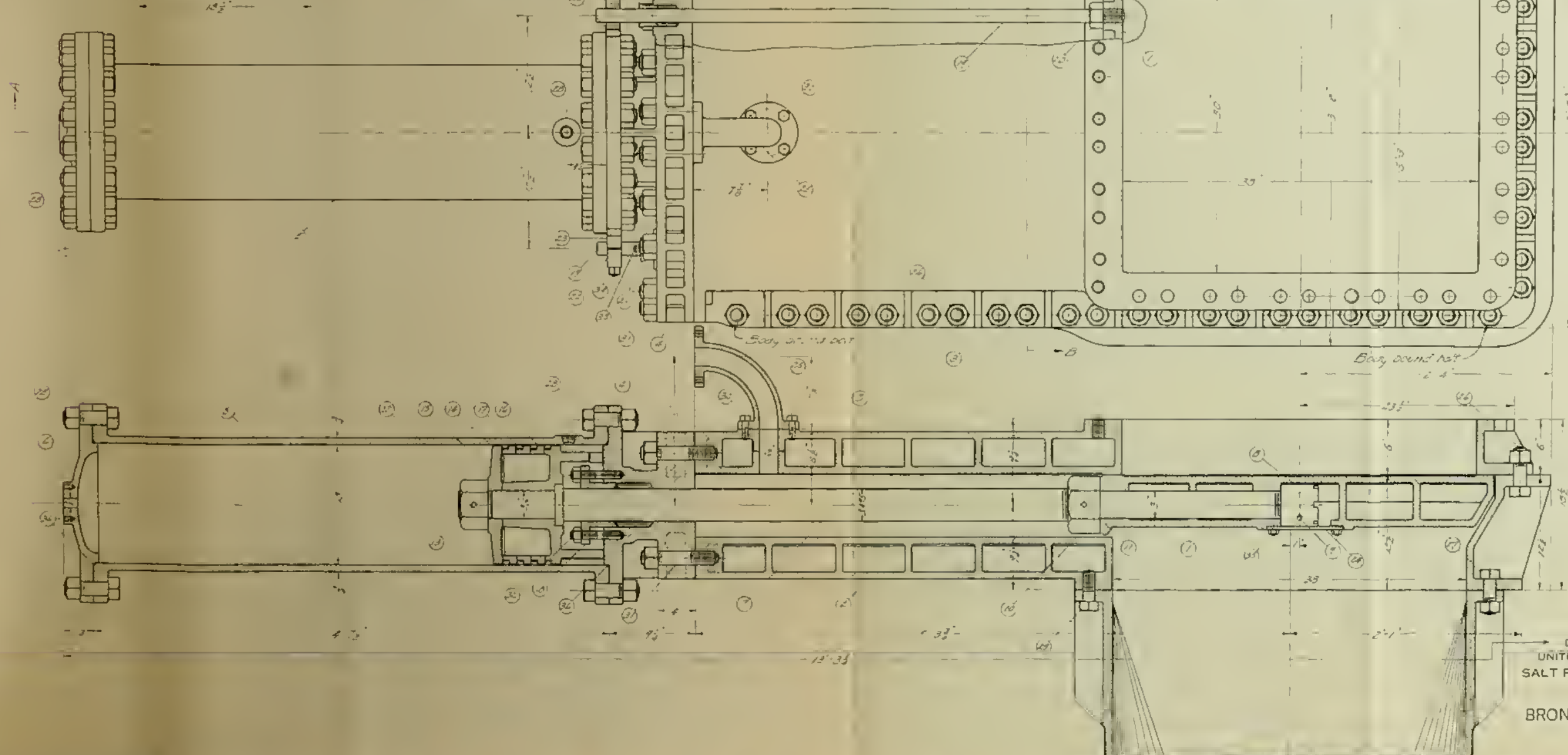
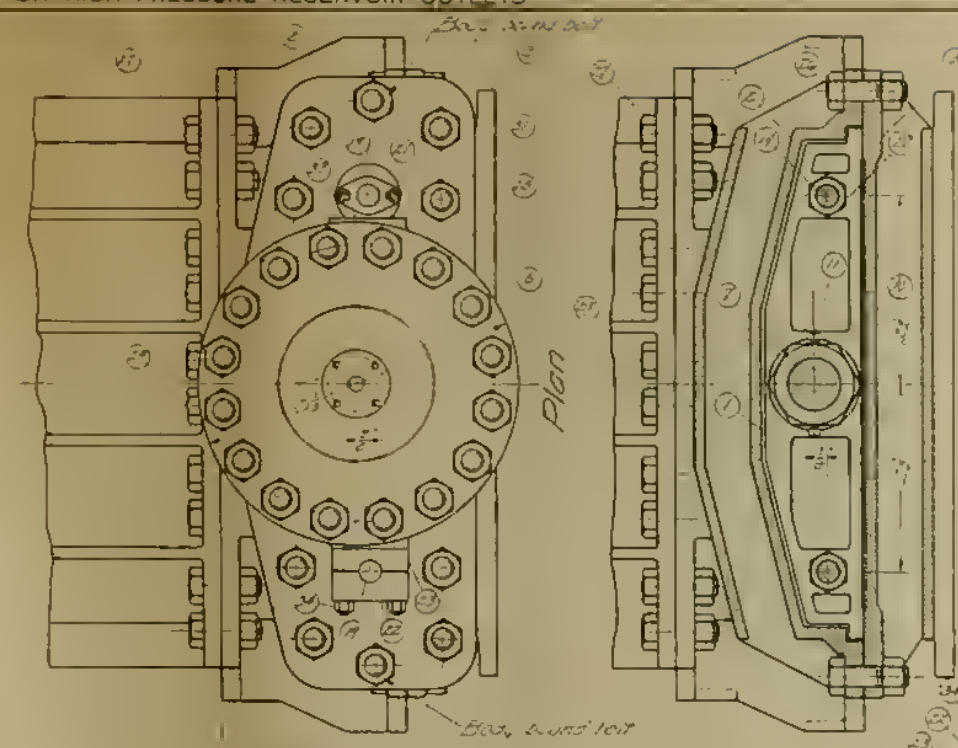
NO. 20345 PLATE 5 OF 88

1923

25-E-606

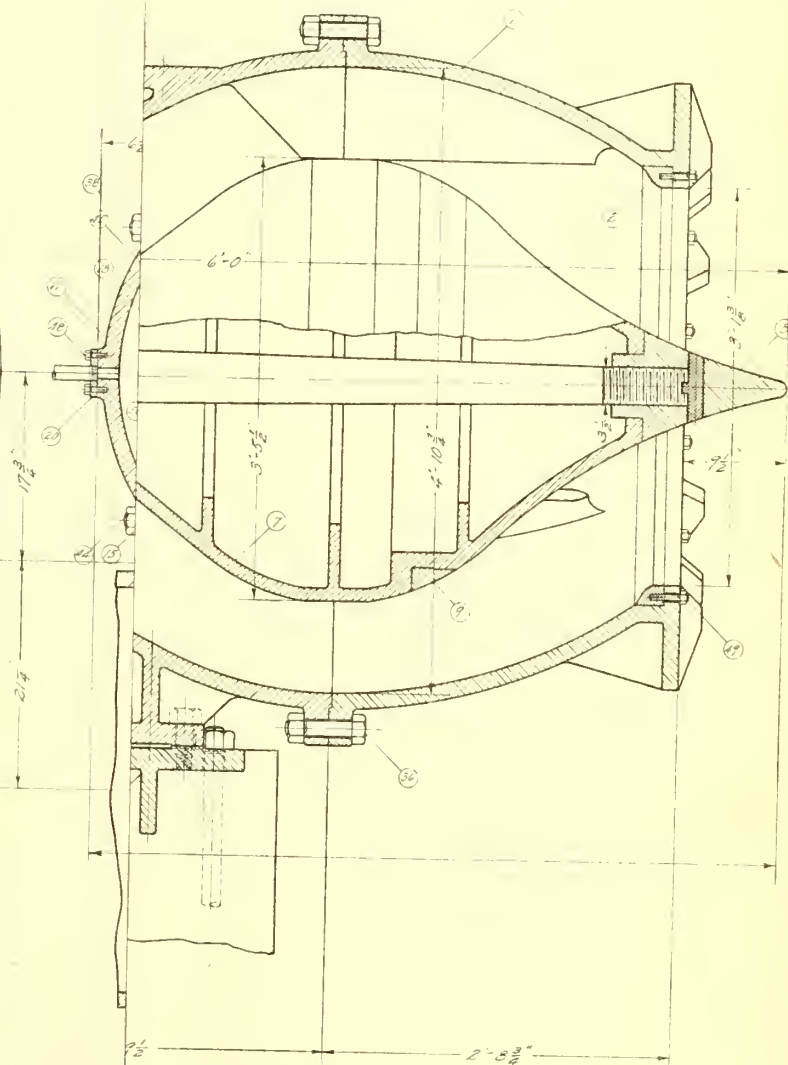
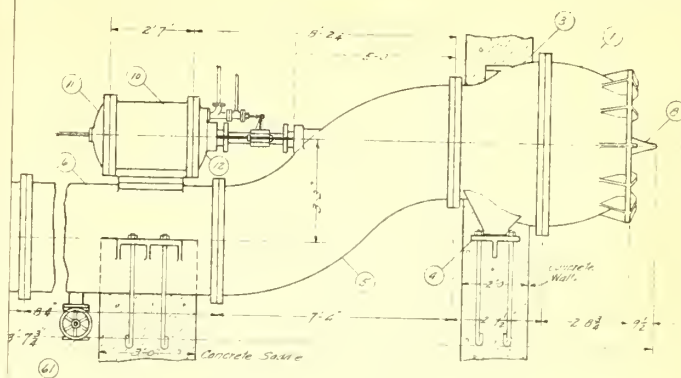
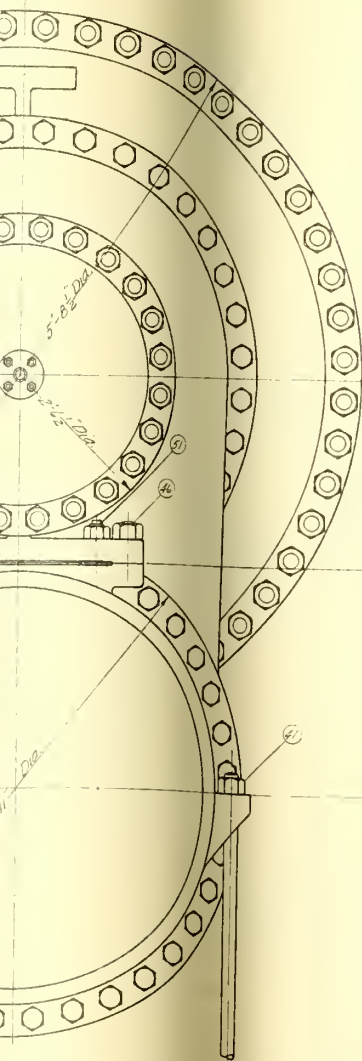






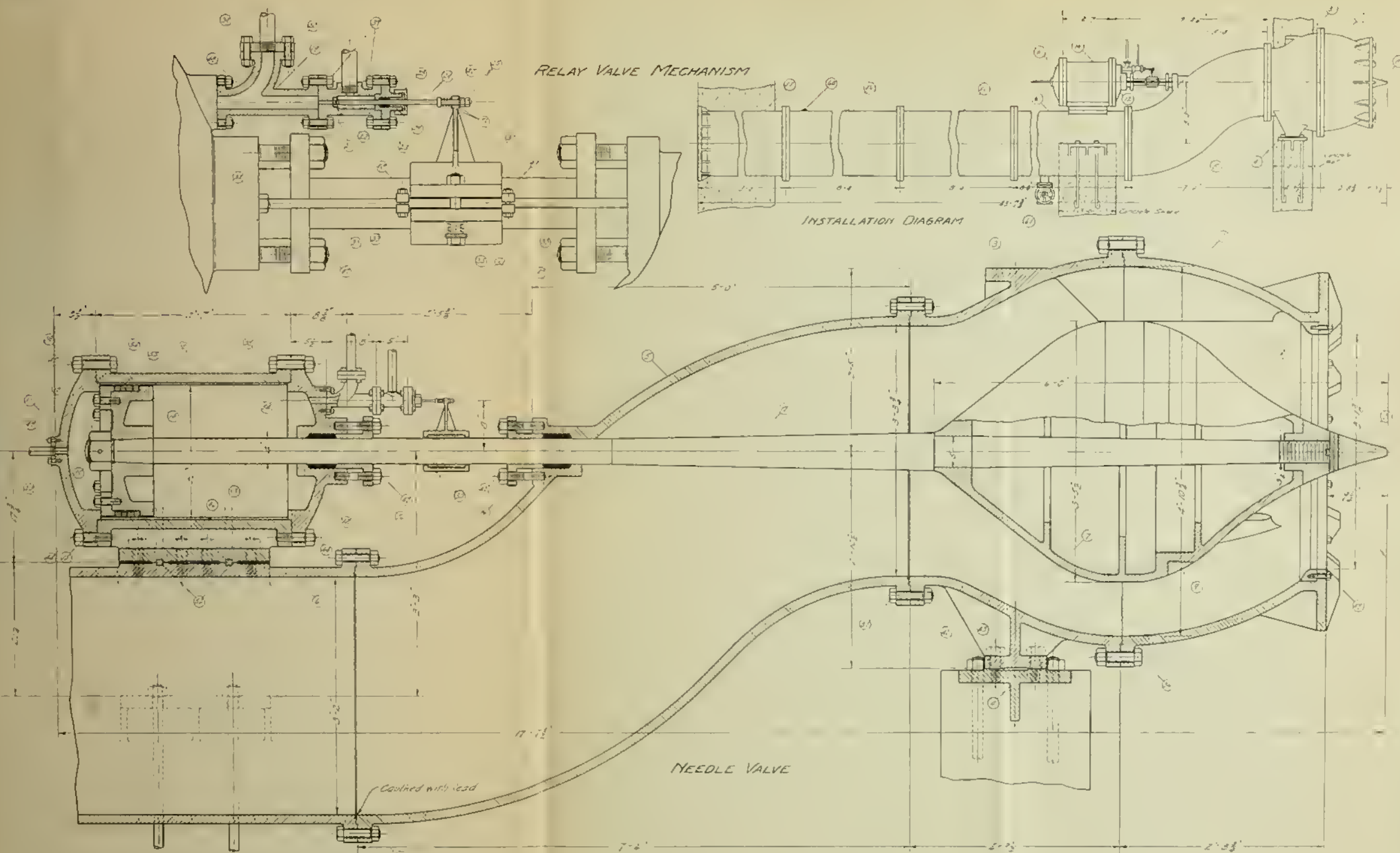
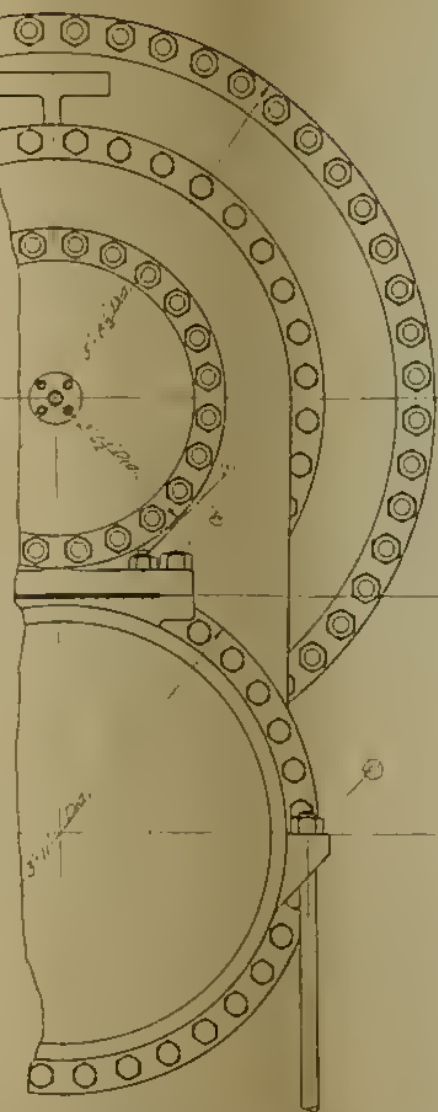
Bill of Material for One Gate - 2 Required									
Qty	Req	Material	Name	Remarks	Symbol	Qty	Req	Material	Name
1	1	Bronze	Gate Leaf	See Ding 7-826		2	2	Bronze	Clamp Blocks - Upper
1	1		Housing			1	1	Brass	Clamp Blocks - Lower
1	1		Frame	7-827		1	1	Brass	Core Plate
1	1		Housing Core	7-828		1	1	Bronze	Elbow
1	1		Cylinder			54	54	Thin Bronze	Bolts & Nuts for 18" x 48"
1	1	Thin Bronze	Gate Stem	1-827		34	34		18" x 48"
1	1		Gate Leaf Lock Nut			6	6		18" x 48"
2	2		Set Screw for 3/4" x 1 1/2"			4	4		Cap Screws 18" x 3/4"
2	2		Bearing Nut			16	16		Studs & Nuts 18" x 3/4"
2	2		Set Screw for 1/2" x 1 1/2"			2	2		18" x 3/4"
1	1		Piston Lock Nut			4	4		18" x 3/4"
2	2		Set Screw for 1/2" x 1 1/2"			4	4		18" x 3/4"
1	1	Bronze	Piston Body	7-828		4	4		18" x 3/4"
1	1		Head			2	2		The Eclipse Special/Random Gasket
3	3		Bull Ring			1	1	Plate Steel	14" Wrench
4	4		Piston Ring			1	1		14"
1	1		Stuffing Box Gland for 1 1/2"			1	1		14"
2	2	Thin Bronze	Indicator Rod	7-827					
2	2		Lock Nut for						
2	2	Bronze	Stuffing Box Gland for 1 1/2"	7-828					

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZ
ROOSEVELT DAM
BRONZE GATE 30 INCH X 38 INCH
NO 20346 PLATE 6 OF 80
1923



Qty Req	Material	Name	QTY
1	Seam Steel	Nozzle Tip	18 x 4 1/2
1	Heavy Bronze	Seat Ring for (1)	18 x 6
1	Seam Steel	Nozzle Body	18 x 4 1/2
1	"	Seat Plate for (3)	18 x 6
1	"	Offset Pipe	18 x 7
1	"	Cutter Pipe	18 x 7
1	"	Needle	3 x 2 1/2
1	Bronze	Needle Point	7 x 3 1/2
1	Heavy Bronze	Seat Ring for (7)	3 x 1 1/2
1	Seam Steel	Cylinder	1'-0" Sp. x 24"
1	"	Cylinder Cover	"
1	"	Cylinder Head	"
1	Polished Bronze	Cylinder Liner	8 dia x 5'-0" approx
1	Bronze	Piston	"
1	"	Bull Ring	"
1	"	Stuffing Box Gland	12 x 4 1/2
1	Tobin Bronze	Shaft	14 x 5
1	"	Shaft Nut	14 x 6
1	Cast Iron	1 Extra Heavy Tee with sweep	"
2	"	1 Extra Heavy Companion Flange	"
1	Bronze	Heavy Valve Body	7 x 3 1/2

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZONA
ROOSEVELT DAM
NEEDLE VALVE 38 INCH DIAMETER
NO. 20347 PLATE 7 OF 88
1923

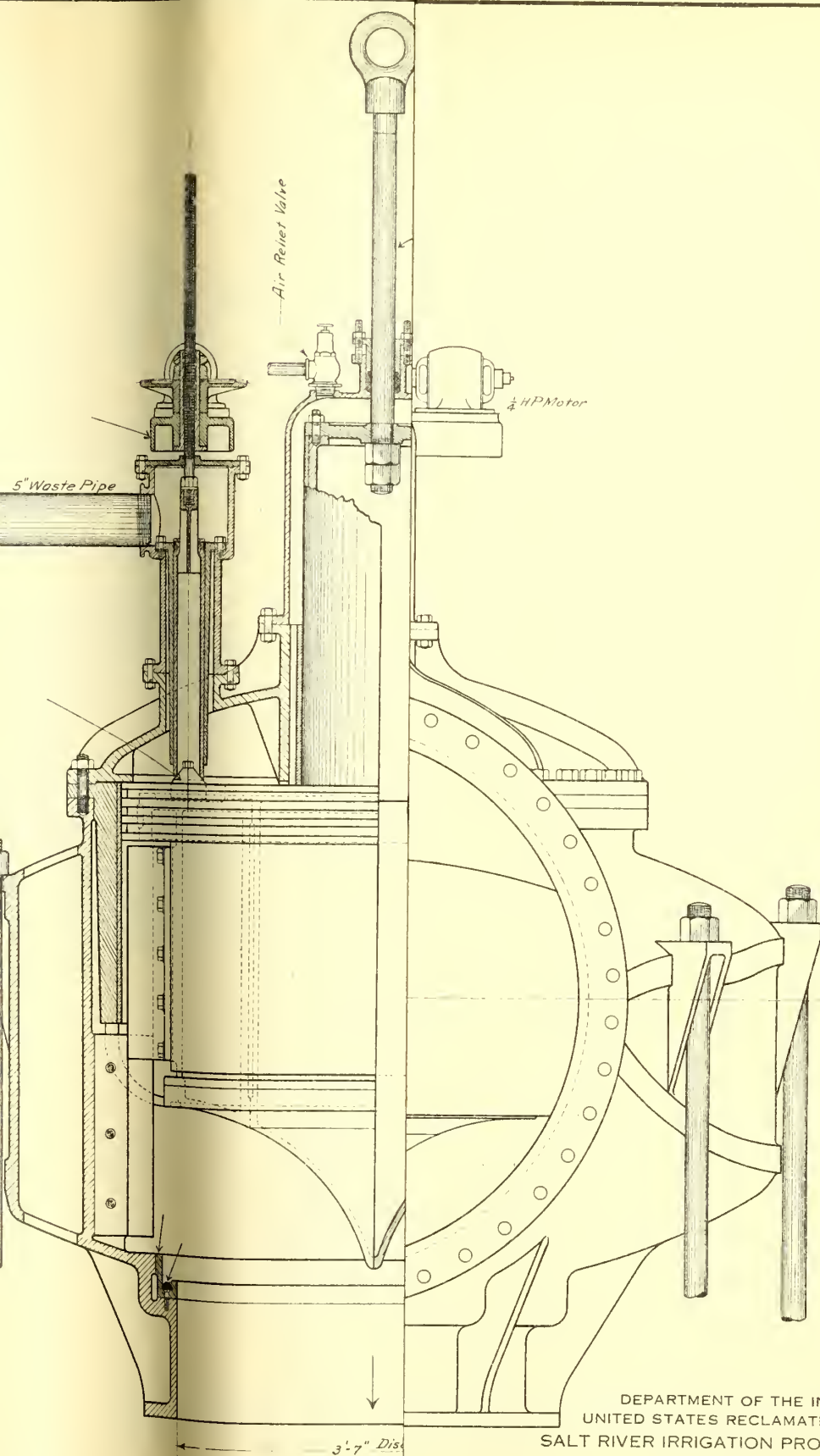


BILL OF MATERIAL FOR ONE OUTLET ~ 2 WANTED

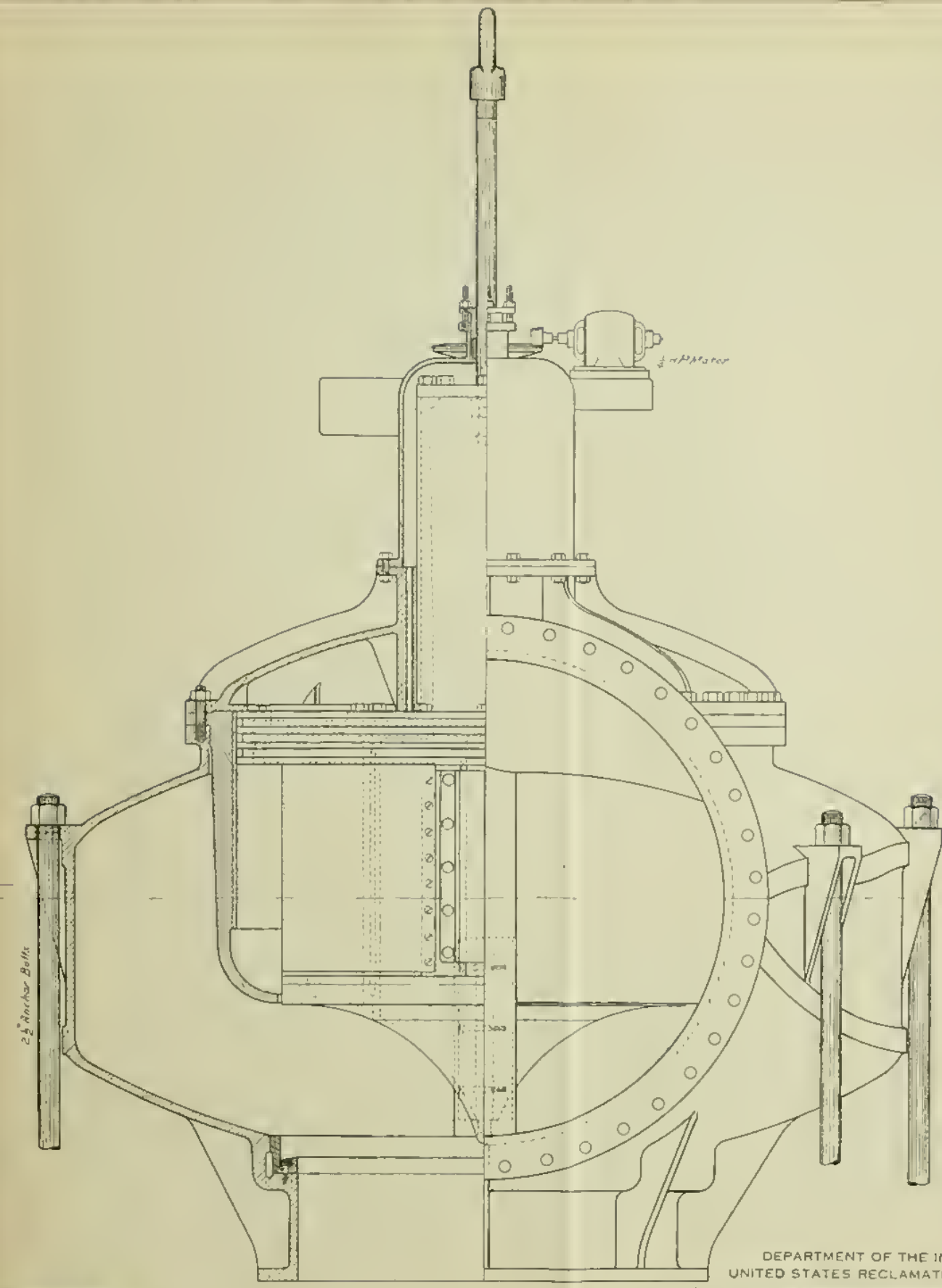
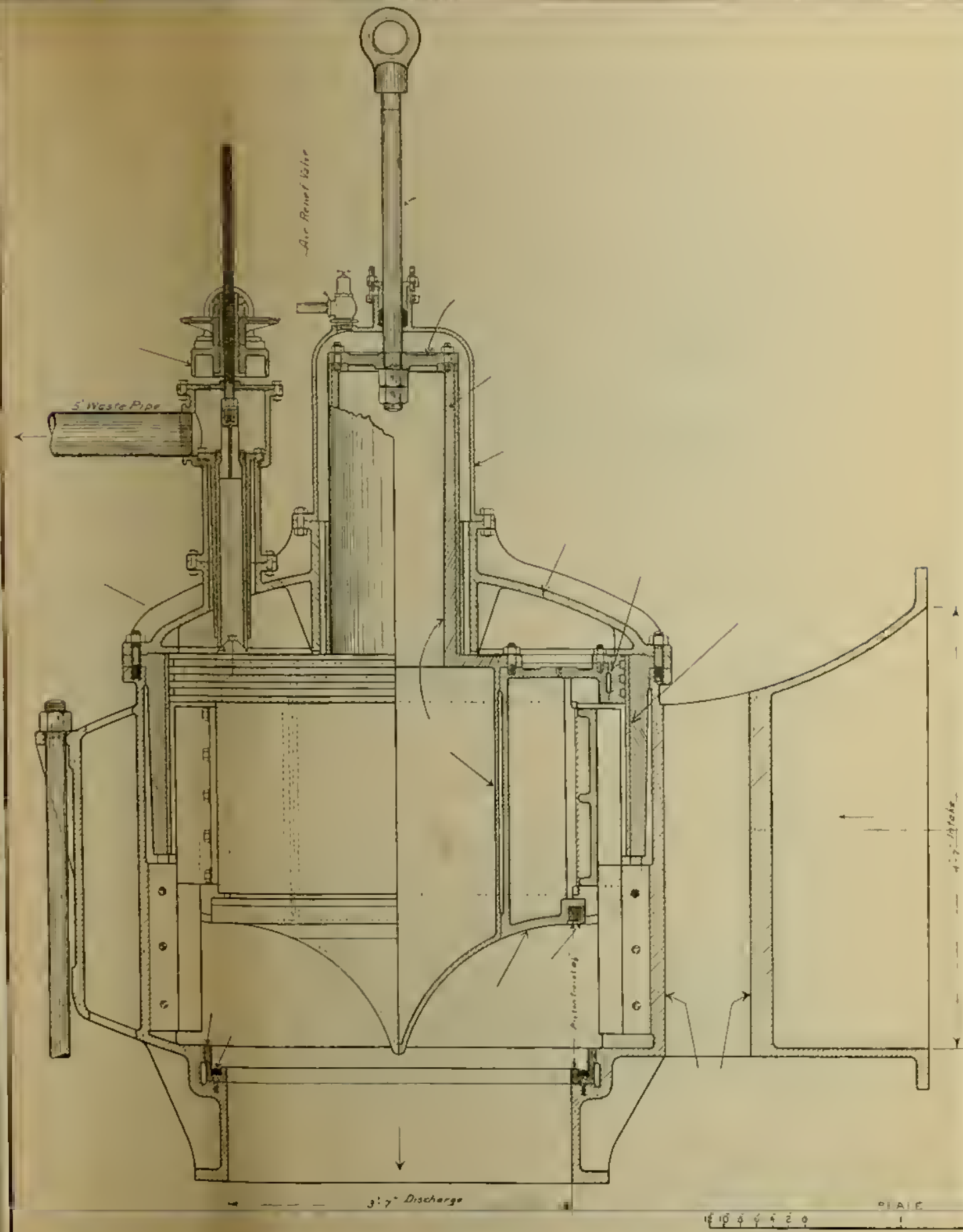
QTY	ITEM NO.	DESCRIPTION	REMARKS	QTY	ITEM NO.	DESCRIPTION	REMARKS	QTY	ITEM NO.	DESCRIPTION	REMARKS	QTY	ITEM NO.	DESCRIPTION	REMARKS
1	1	Valve Body	17'-0"	1	1	Valve Body	17'-0"	1	1	Valve Body	17'-0"	1	1	Valve Body	17'-0"
1	2	Needle Valve	11'-0"	1	2	Needle Valve	11'-0"	1	2	Needle Valve	11'-0"	1	2	Needle Valve	11'-0"
1	3	Relay Valve Mechanism	5'-0"	1	3	Relay Valve Mechanism	5'-0"	1	3	Relay Valve Mechanism	5'-0"	1	3	Relay Valve Mechanism	5'-0"
1	4	Installation Diagram		1	4	Installation Diagram		1	4	Installation Diagram		1	4	Installation Diagram	
1	5	Coated with lead		1	5	Coated with lead		1	5	Coated with lead		1	5	Coated with lead	
1	6	Flange		1	6	Flange		1	6	Flange		1	6	Flange	
1	7	Anchor		1	7	Anchor		1	7	Anchor		1	7	Anchor	
1	8	Washer		1	8	Washer		1	8	Washer		1	8	Washer	
1	9	Bracket		1	9	Bracket		1	9	Bracket		1	9	Bracket	
1	10	Pin		1	10	Pin		1	10	Pin		1	10	Pin	
1	11	Washer		1	11	Washer		1	11	Washer		1	11	Washer	
1	12	Pin		1	12	Pin		1	12	Pin		1	12	Pin	
1	13	Washer		1	13	Washer		1	13	Washer		1	13	Washer	
1	14	Pin		1	14	Pin		1	14	Pin		1	14	Pin	
1	15	Washer		1	15	Washer		1	15	Washer		1	15	Washer	
1	16	Pin		1	16	Pin		1	16	Pin		1	16	Pin	
1	17	Washer		1	17	Washer		1	17	Washer		1	17	Washer	
1	18	Pin		1	18	Pin		1	18	Pin		1	18	Pin	
1	19	Washer		1	19	Washer		1	19	Washer		1	19	Washer	
1	20	Pin		1	20	Pin		1	20	Pin		1	20	Pin	
1	21	Washer		1	21	Washer		1	21	Washer		1	21	Washer	
1	22	Pin		1	22	Pin		1	22	Pin		1	22	Pin	
1	23	Washer		1	23	Washer		1	23	Washer		1	23	Washer	
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1	26	Pin		1	26	Pin		1	26	Pin		1	26	Pin	
1	27	Washer		1	27	Washer		1	27	Washer		1	27	Washer	
1	28	Pin		1	28	Pin		1	28	Pin		1	28	Pin	
1	29	Washer		1	29	Washer		1	29	Washer		1	29	Washer	
1	30	Pin		1	30	Pin		1	30	Pin		1	30	Pin	
1	31	Washer		1	31	Washer		1	31	Washer		1	31	Washer	
1	32	Pin		1	32	Pin		1	32	Pin		1	32	Pin	
1	33	Washer		1	33	Washer		1	33	Washer		1	33	Washer	
1	34	Pin		1	34	Pin		1	34	Pin		1	34	Pin	
1	35	Washer		1	35	Washer		1	35	Washer		1	35	Washer	
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DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZONA
ROOSEVELT DAM
NEEDLE VALVE 38 INCH DIAMETER

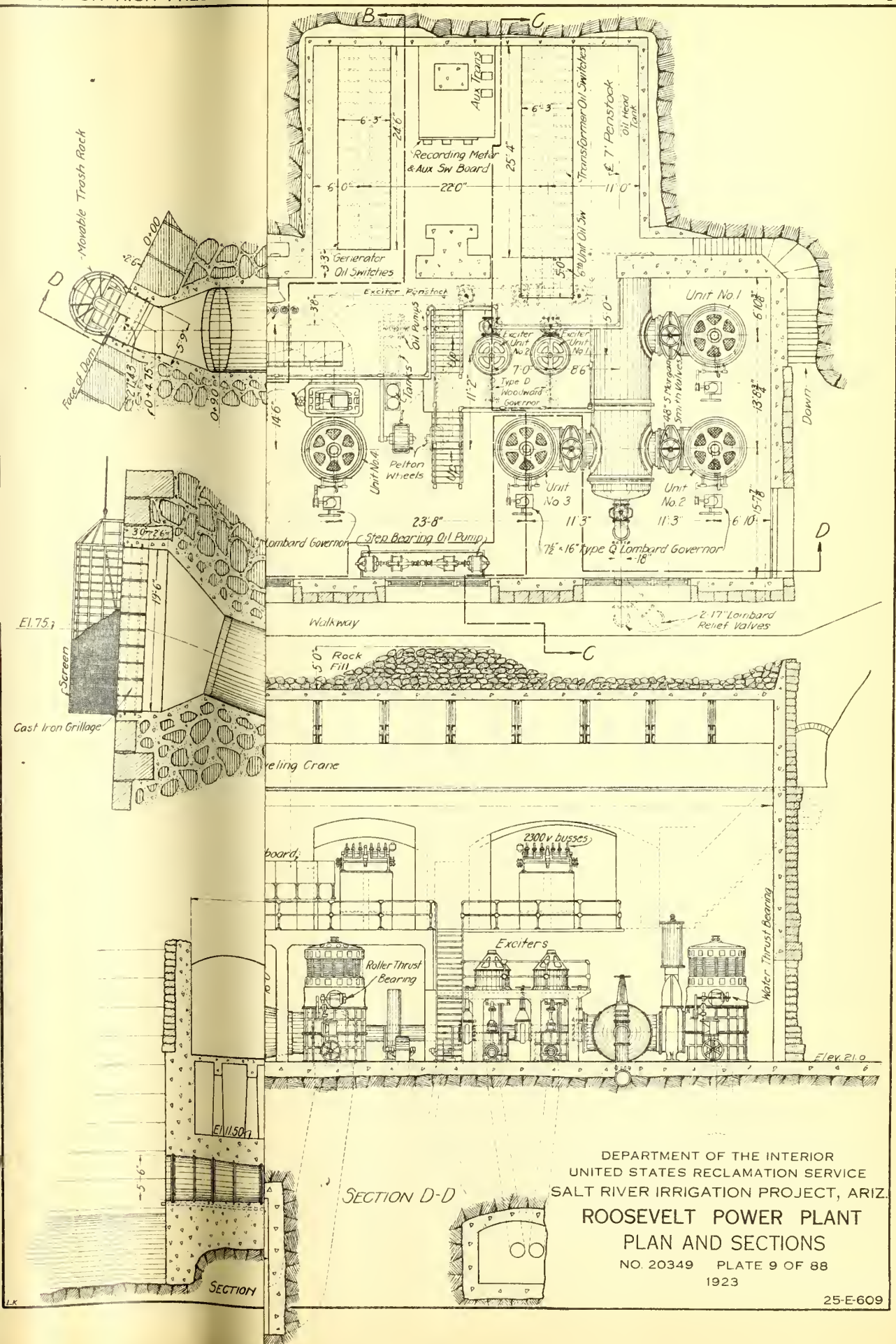
NO 20347 PLATE 7 OF 88
1923



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZONA
ROOSEVELT DAM
BALANCED VALVE 43 INCH DIAMETER
NO. 20348 PLATE 8 OF 88
1923



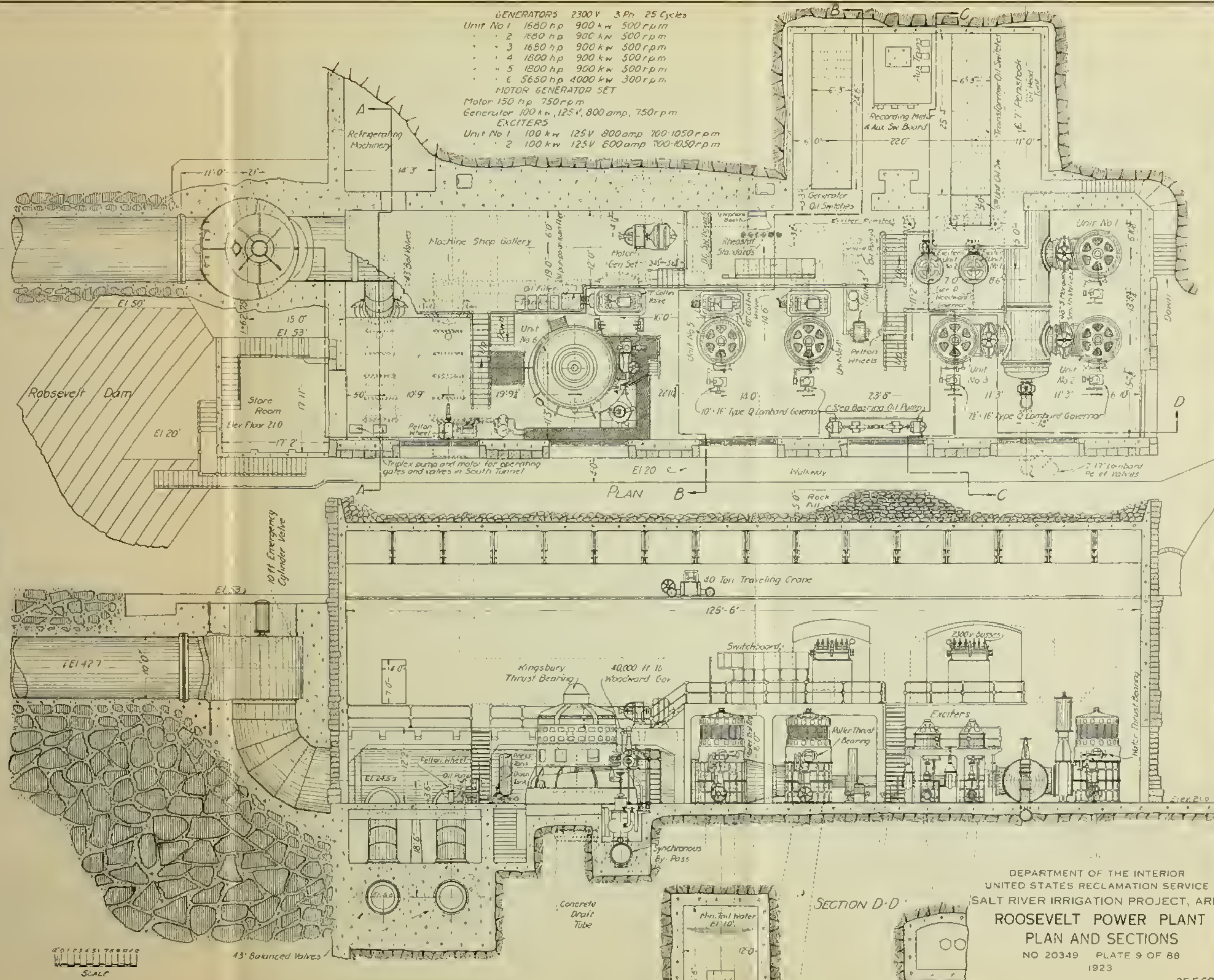
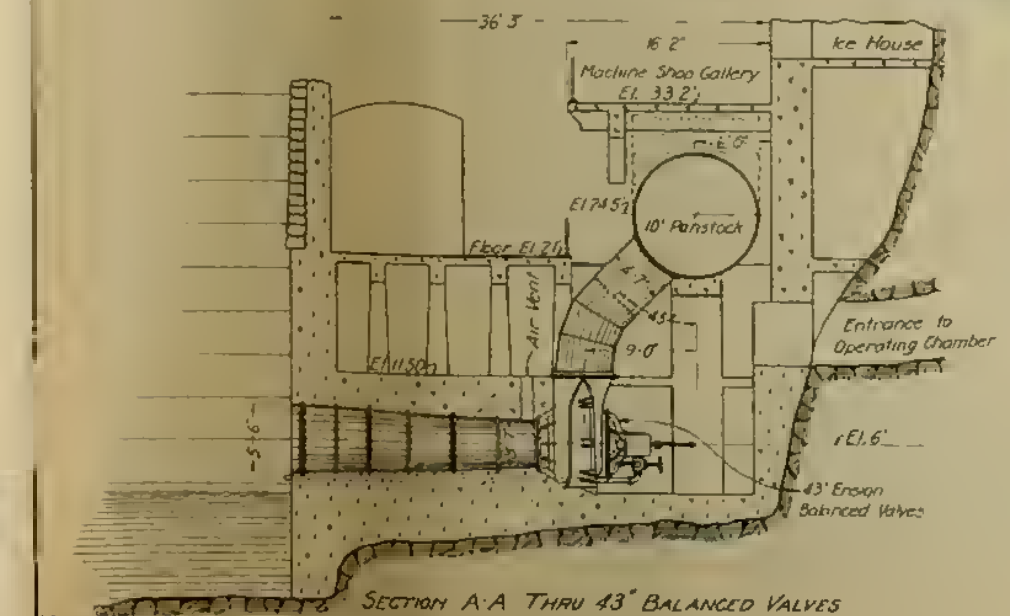
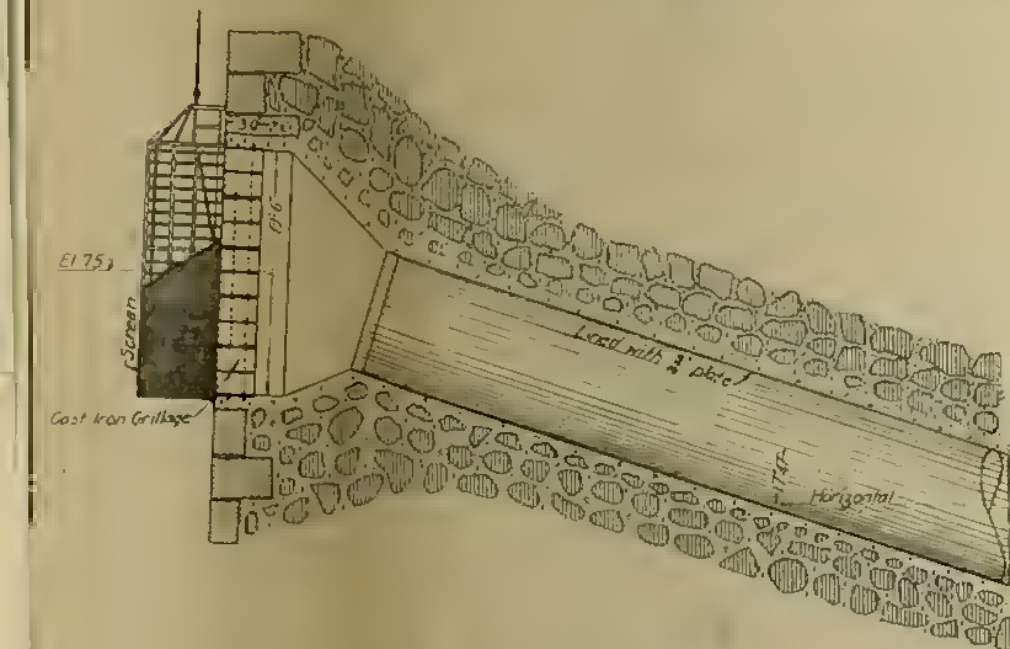
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZONA
ROOSEVELT DAM
BALANCED VALVE 43 INCH DIAMETER
NO 20348 PLATE 8 OF 88
1923

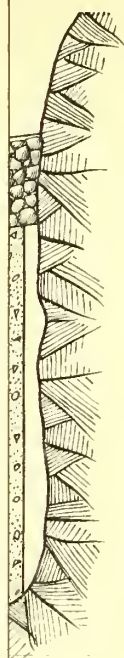


DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZ.

ROOSEVELT POWER PLANT PLAN AND SECTIONS

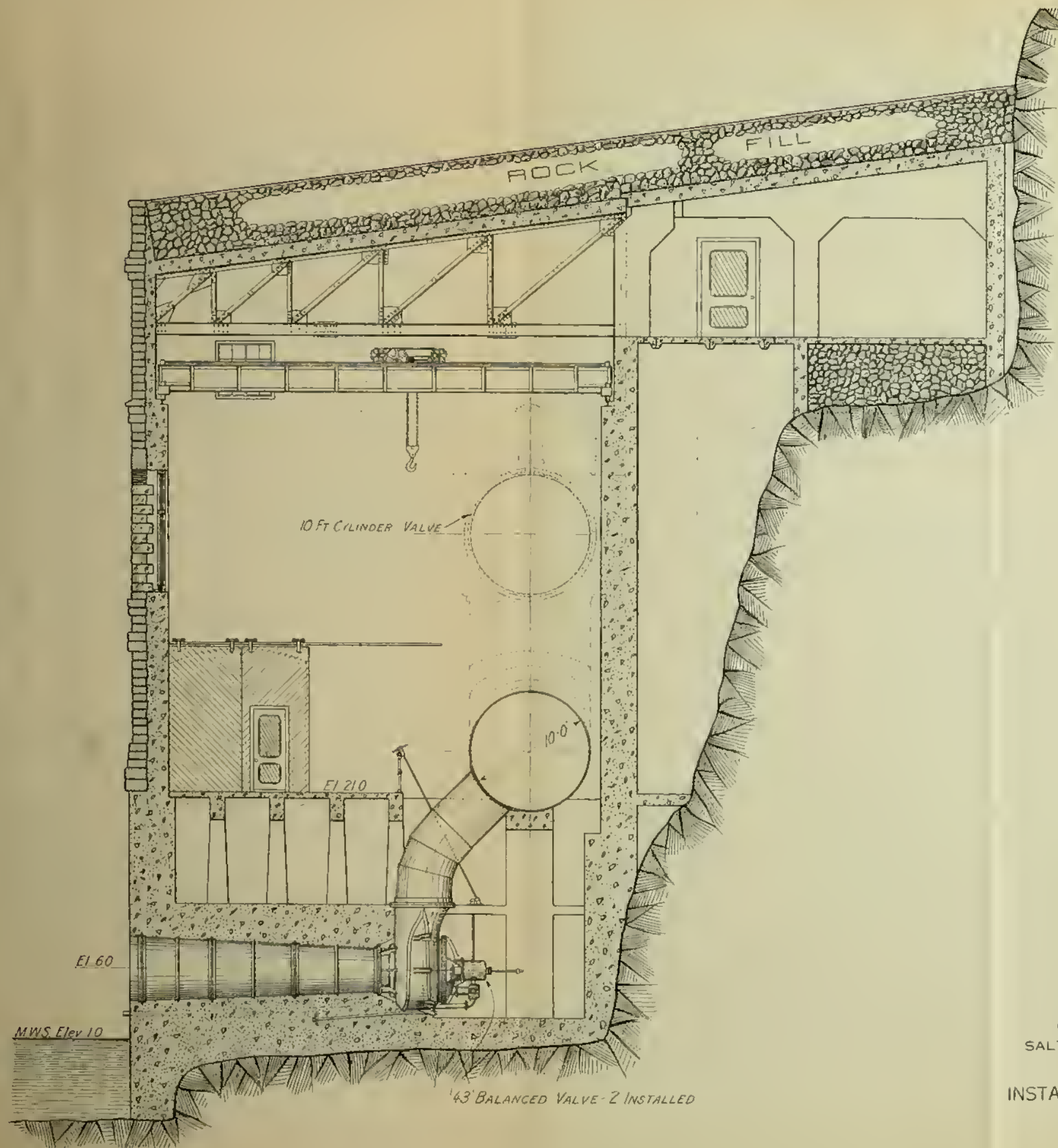
NO. 20349 PLATE 9 OF 88
1923





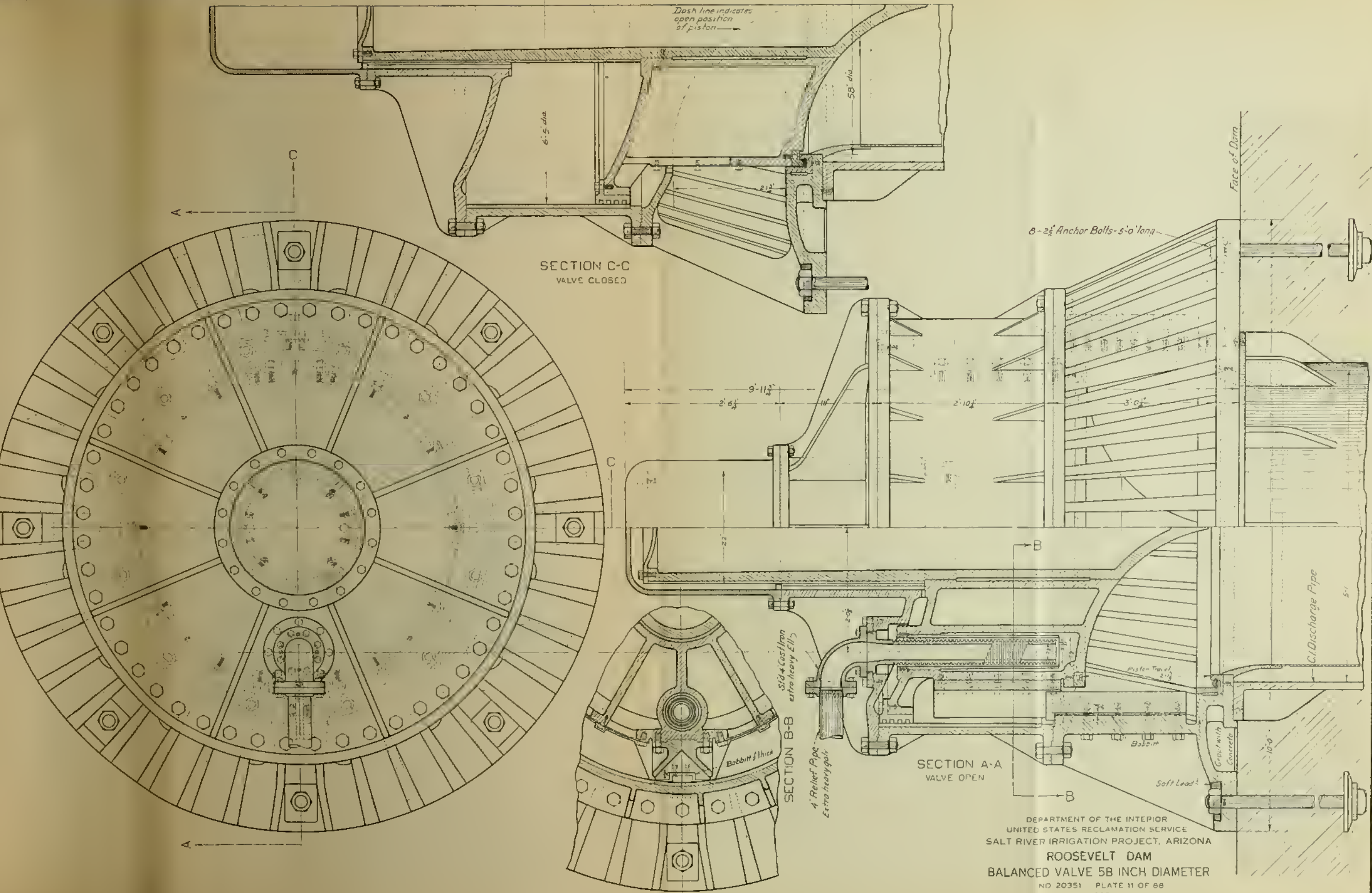
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZONA
ROOSEVELT DAM
INSTALLATION, 43 INCH BALANCED VALVE

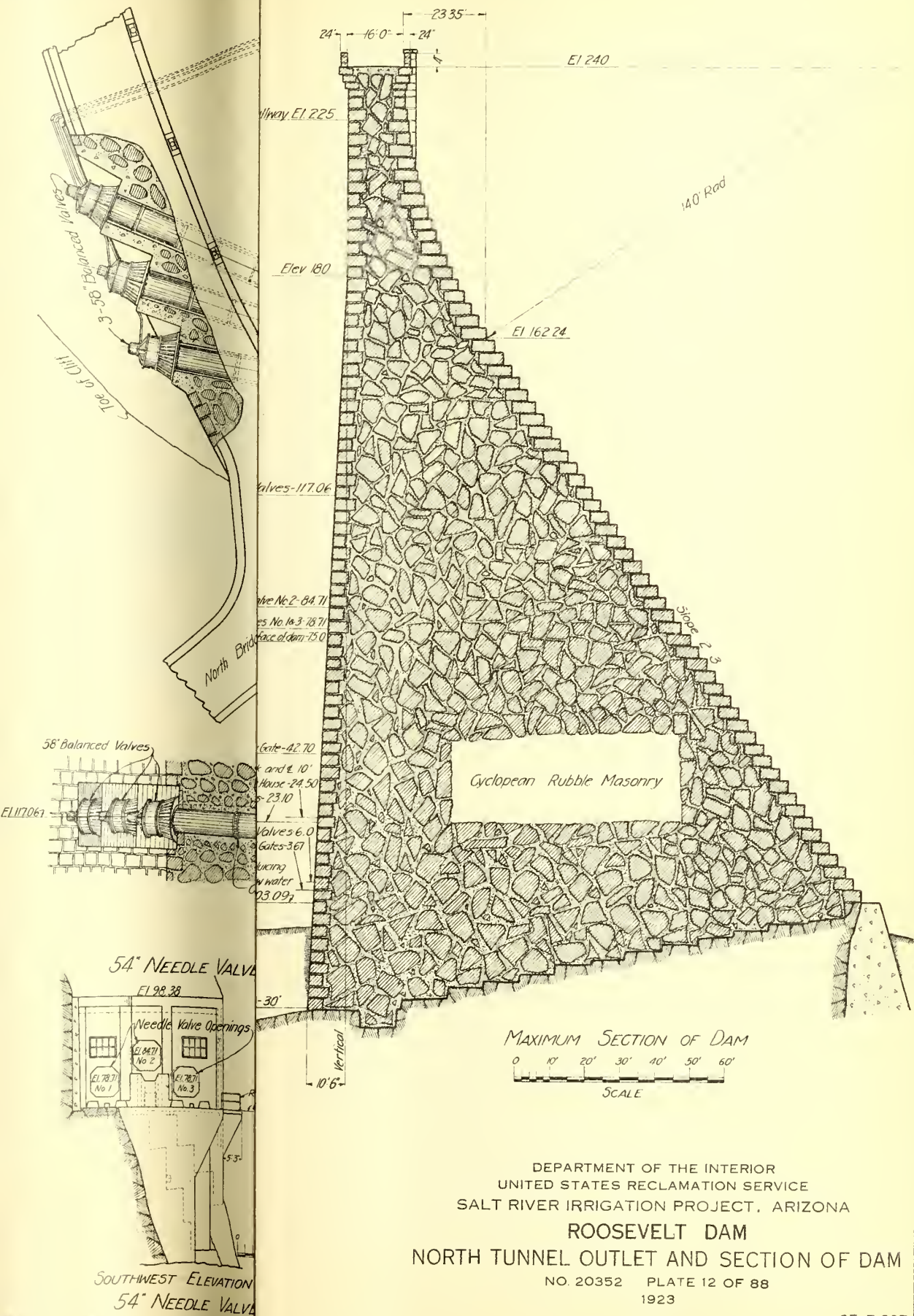
NO. 20350 PLATE 10 OF 88
1923

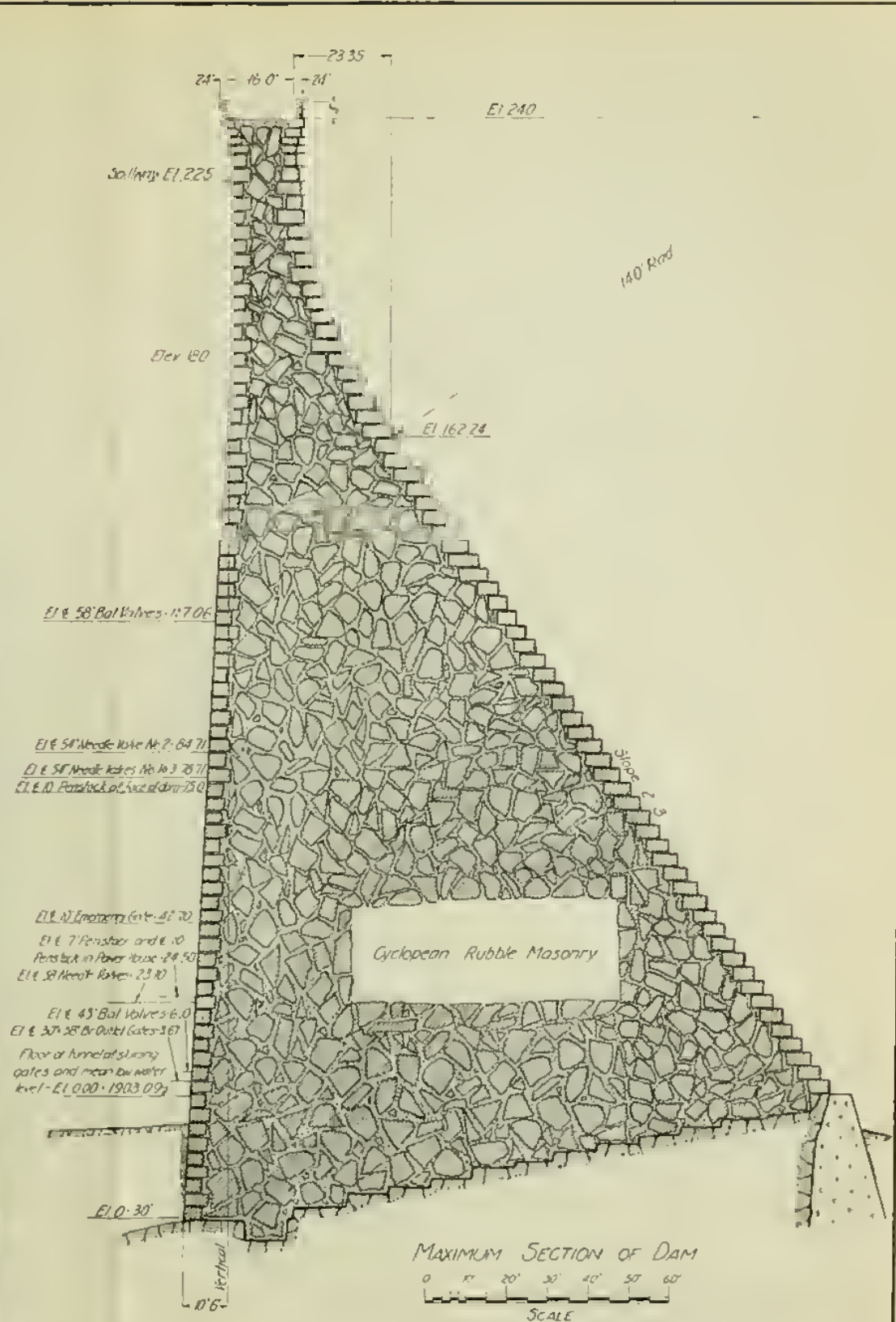
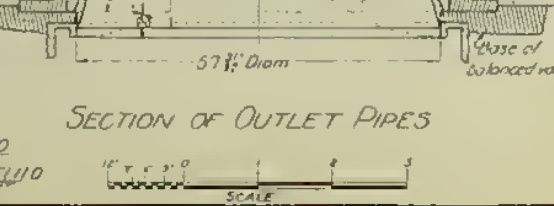
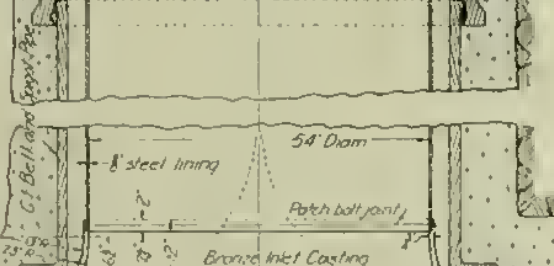
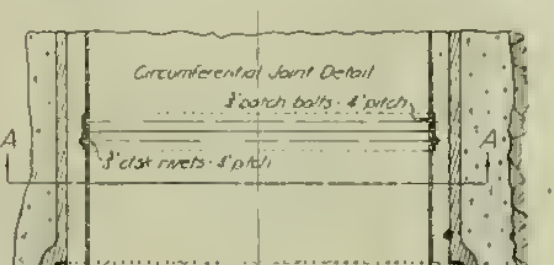
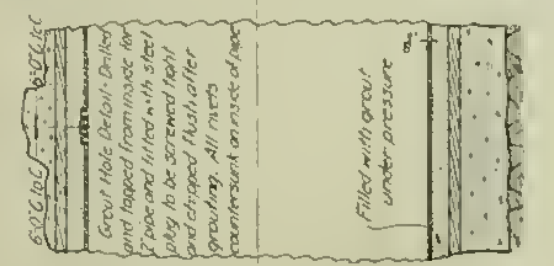
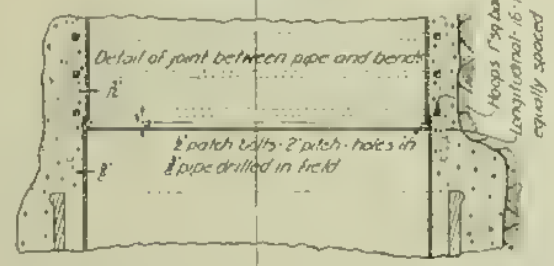
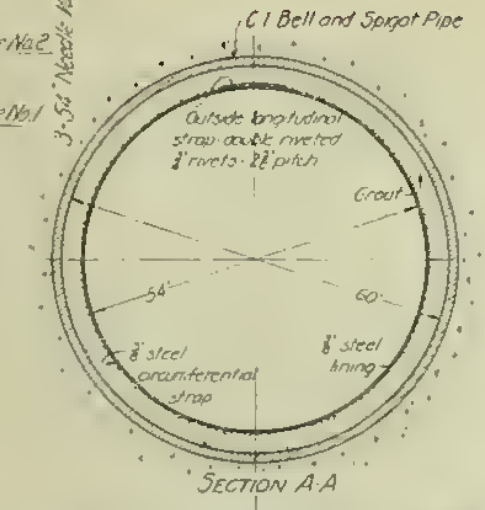
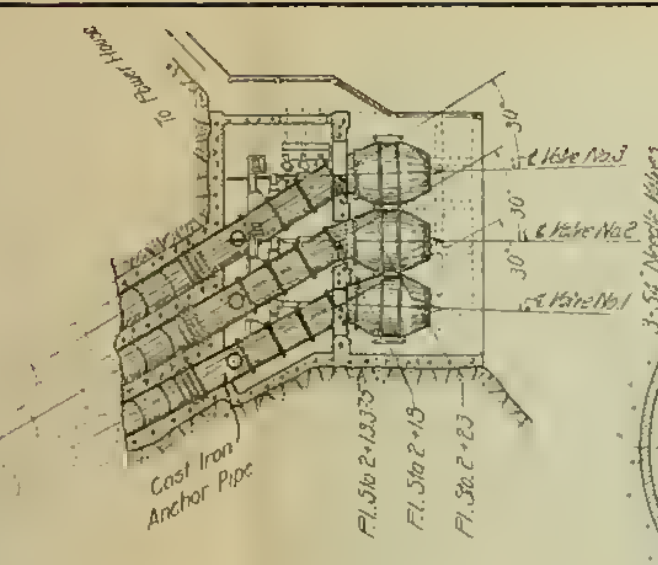
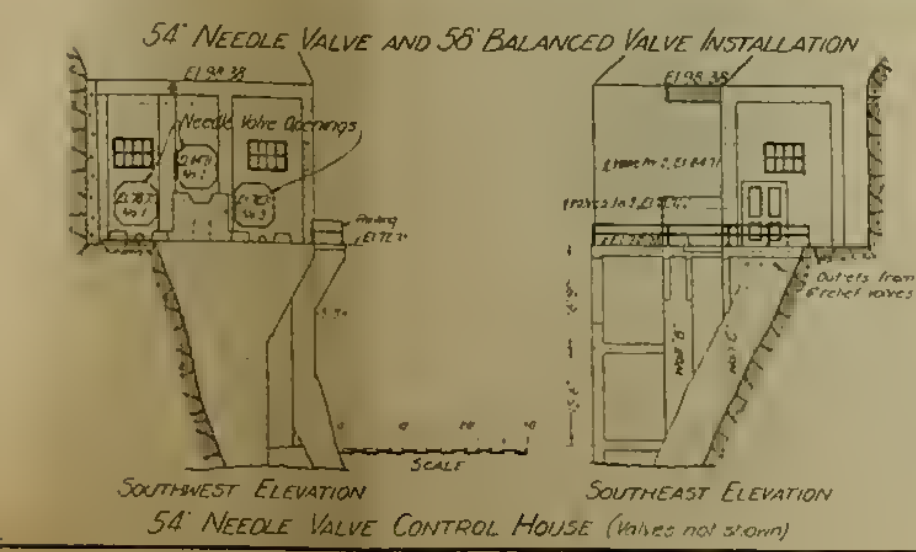
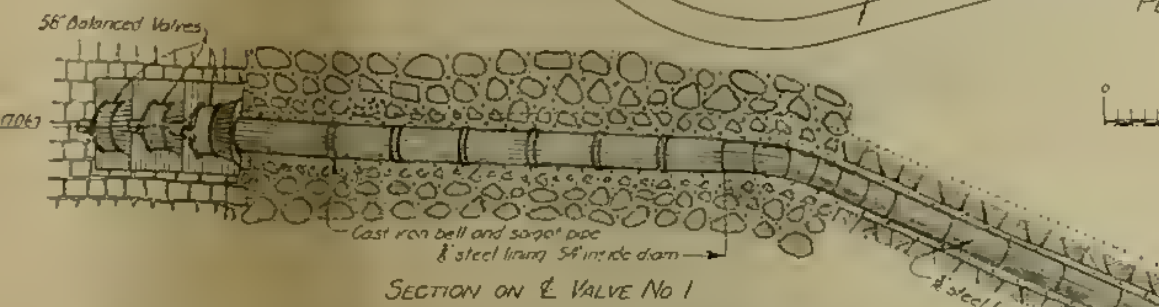
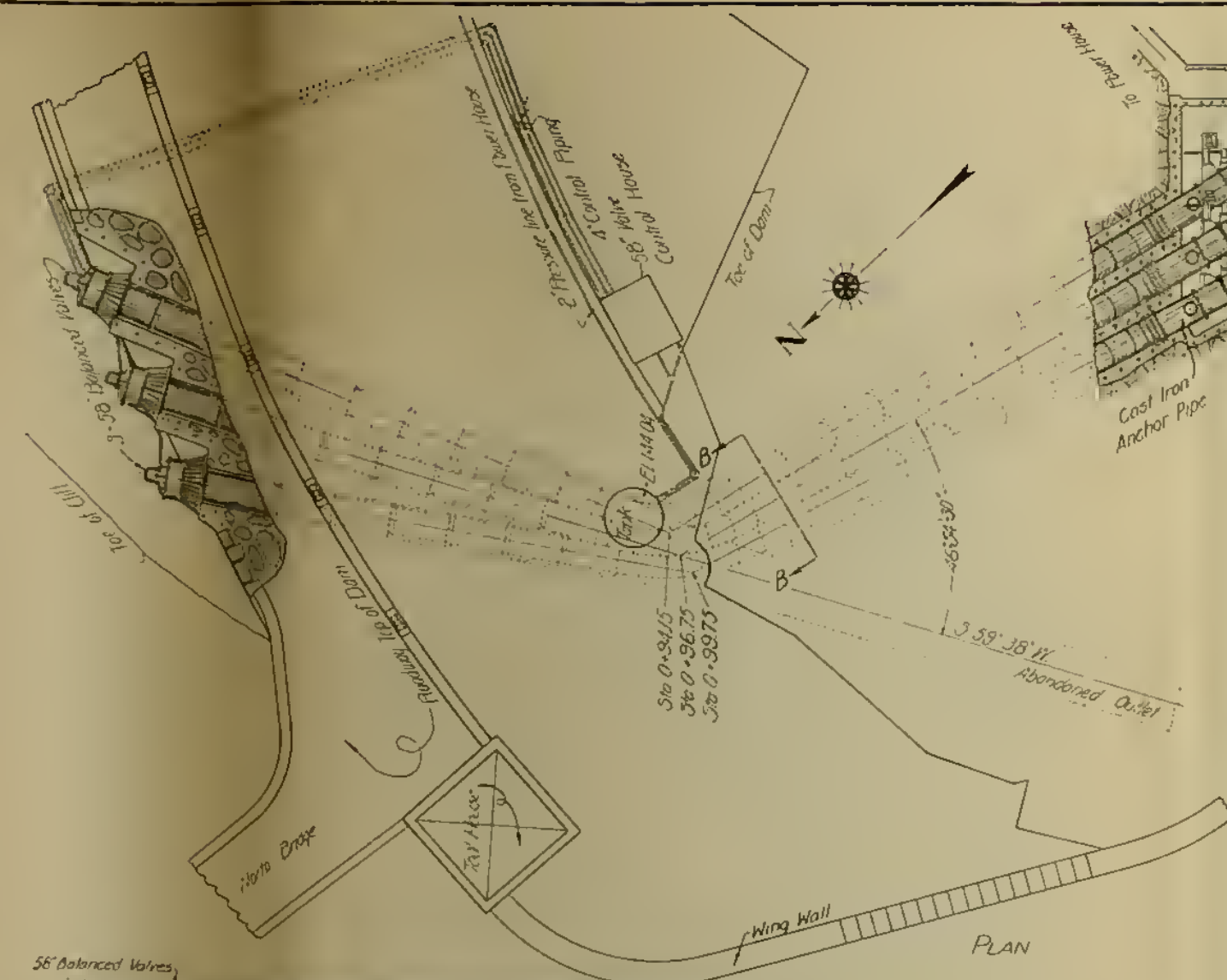


DEPARTMENT OF THE INTERIOR
 UNITED STATES RECLAMATION SERVICE
 SALT RIVER IRRIGATION PROJECT, ARIZONA
ROOSEVELT DAM
 INSTALLATION, 43 INCH BALANCED VALVE
 NO 20350 PLATE 10 OF 88
 1923







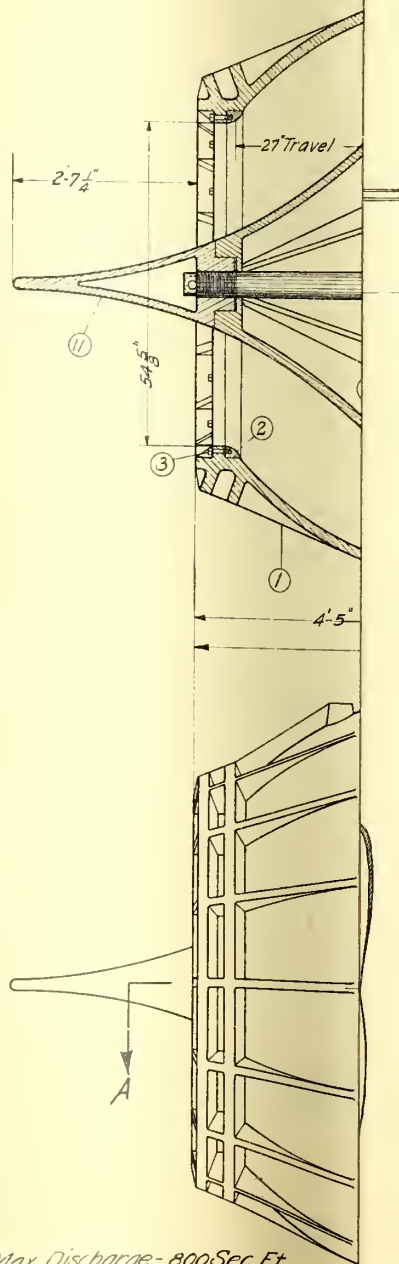


DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZONA
ROOSEVELT DAM
NORTH TUNNEL OUTLET AND SECTION OF DAM
NO 20352 PLATE 12 OF 88
1923

BILL OF MATERIALS

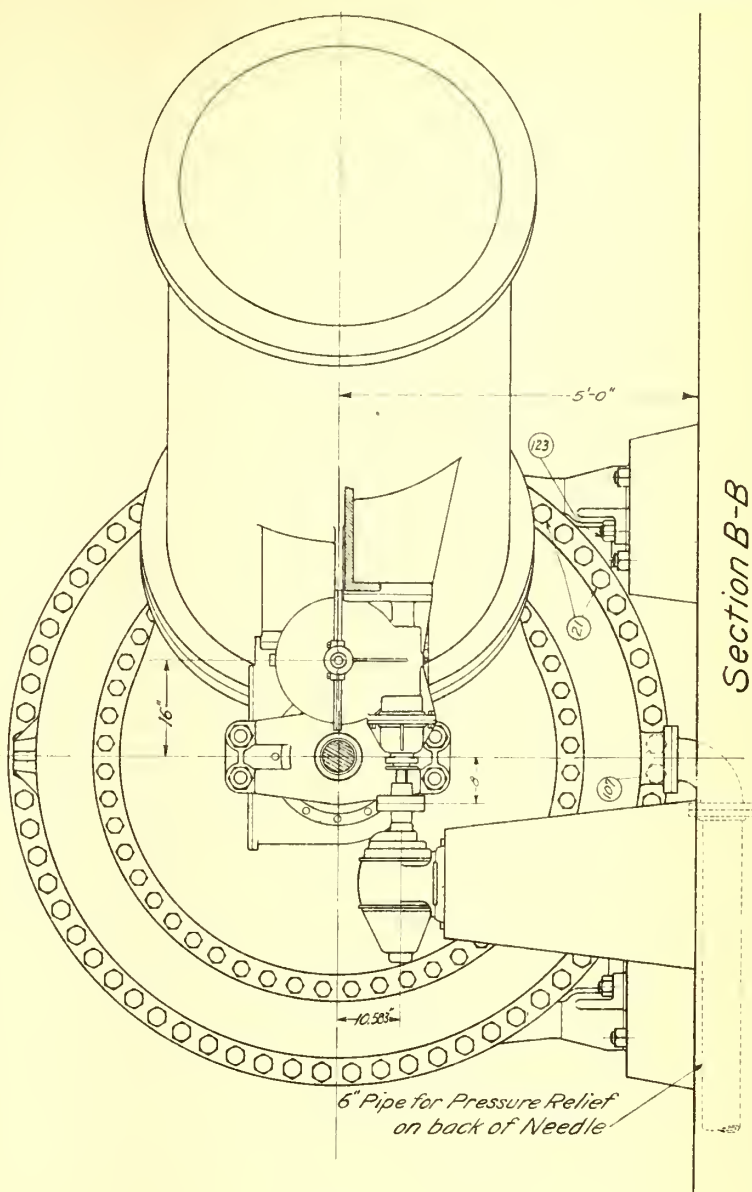
Symbol	No	Req	Material	Notes
(1)	1		Semi Steel	Nozzle
(2)	1		Phosphor Bronze	Nozzle Seat
(3)	16		Tobin	Cap Screws
(4)	1		Semi Steel	Needle
(5)	1		Phosphor Bronze	Needle Seat
(6)	16		Tobin	Cap Screws
(7)	4		Class C	Guide
(8)	1		Semi Steel	Needle Case
(9)	126		2 1/2" Steel bolts w/	
(10)	1		Class D Bronze	Sleeve
(11)	1		Phosphor	Needle Tip
(12)	1		Special Steel	Stem-Needle
(13)	1		Cast Steel	Stem Coupling
(14)	2		Steel	Ring Key/Washer
(15)	1		Semi Steel	Needle Case

See drg 25 E-304 for balance of Bill of Materials



Max Discharge - 800 Sec. Ft.
Max Head - 156 Ft.

2" An



Section B-B

LIST OF DRAWINGS

- NO. 16 30° ELBOW DETAIL
- " 2 30° ELBOW SPLITTER SECTIONS
- " 3 RADIAL SECTIONS 30° ELBOW
- " 4 NEEDLE CASE DETAIL
- " 5 NOZZLE AND SOLE PLATE DETAILS
- " 6 NEEDLE DETAILS
- " 7 GEAR AND THRUST CASE DETAILS
- " 8 SQUARE BEARING AND INDICATOR DETAILS
- " 9 THRUST BEARING, STRUT, GEAR AND NUT
- " 10 WORM AND CASE DETAILS
- " 11 54" PIPE WITH BRACKETS
- " 12 OPERATING MECHANISM
- " 13 GENERAL ARRANGEMENT
- " 14 NEEDLE CASE CONE
- " 15 COUPLING AND GUIDE BEARING DETAILS

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZONA

ROOSEVELT DAM
NEEDLE VALVE 54 INCH DIAMETER

NO. 20353 PLATE 13 OF 88
1923

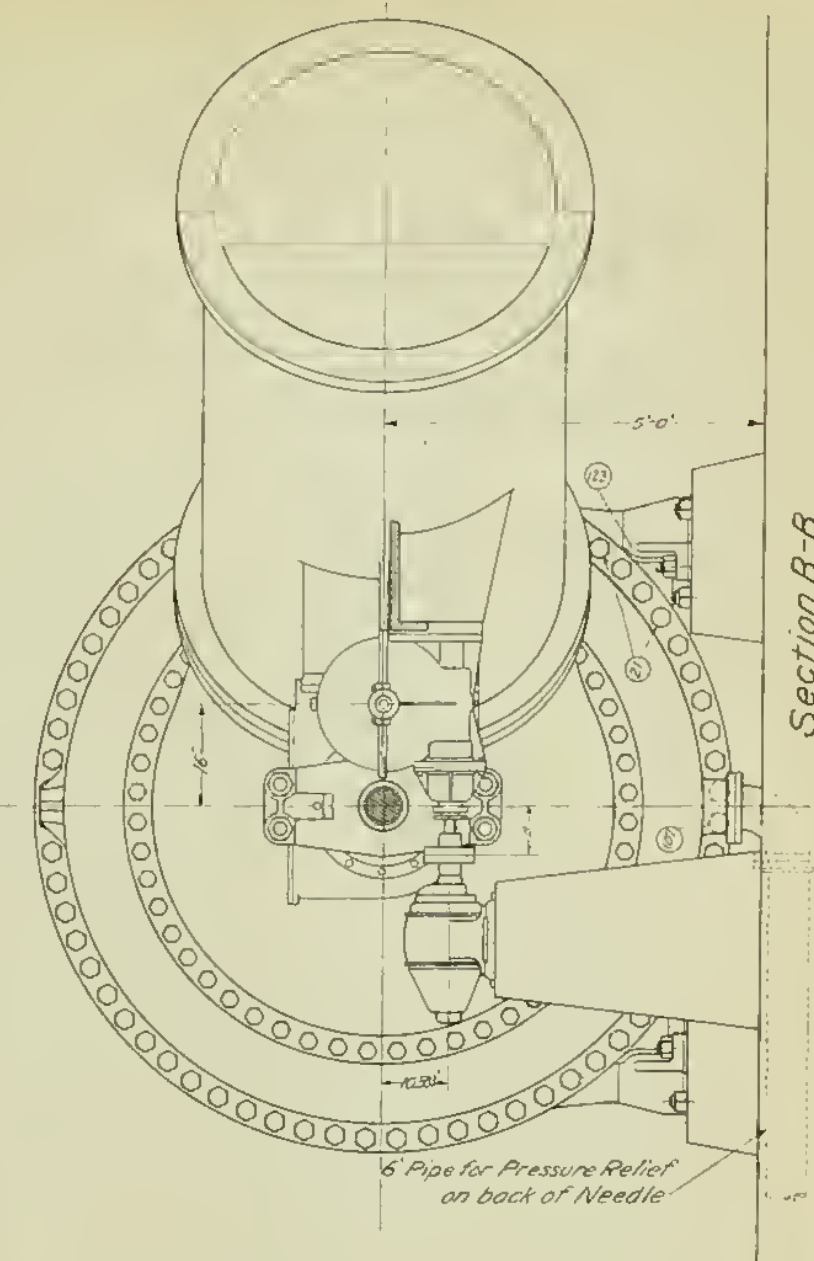
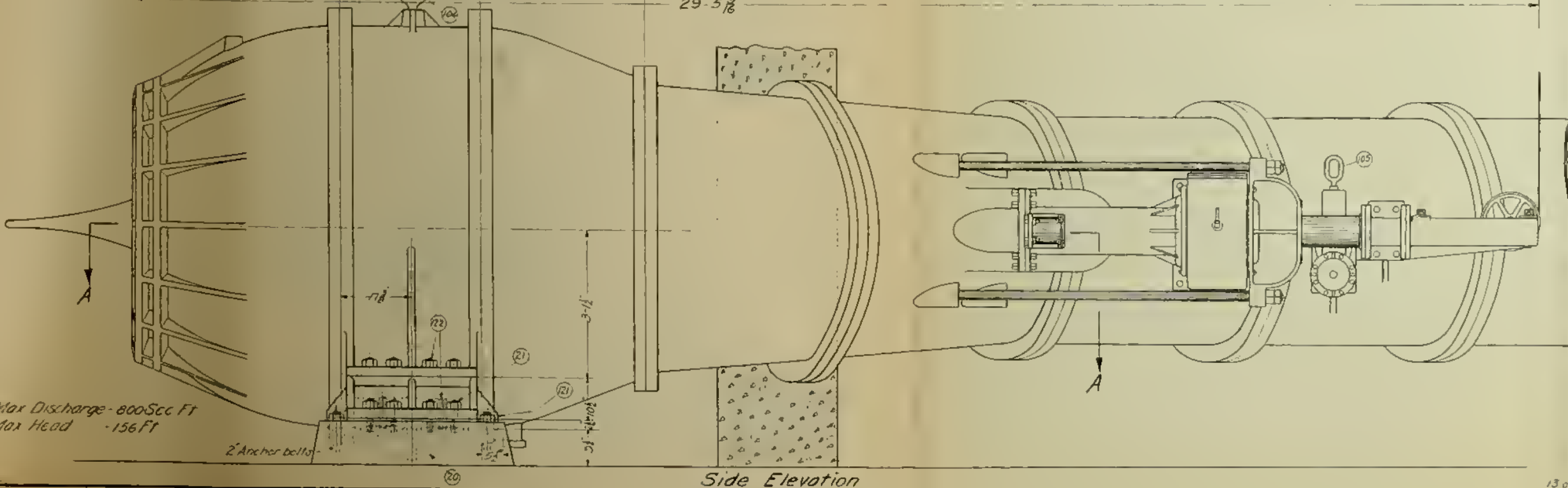
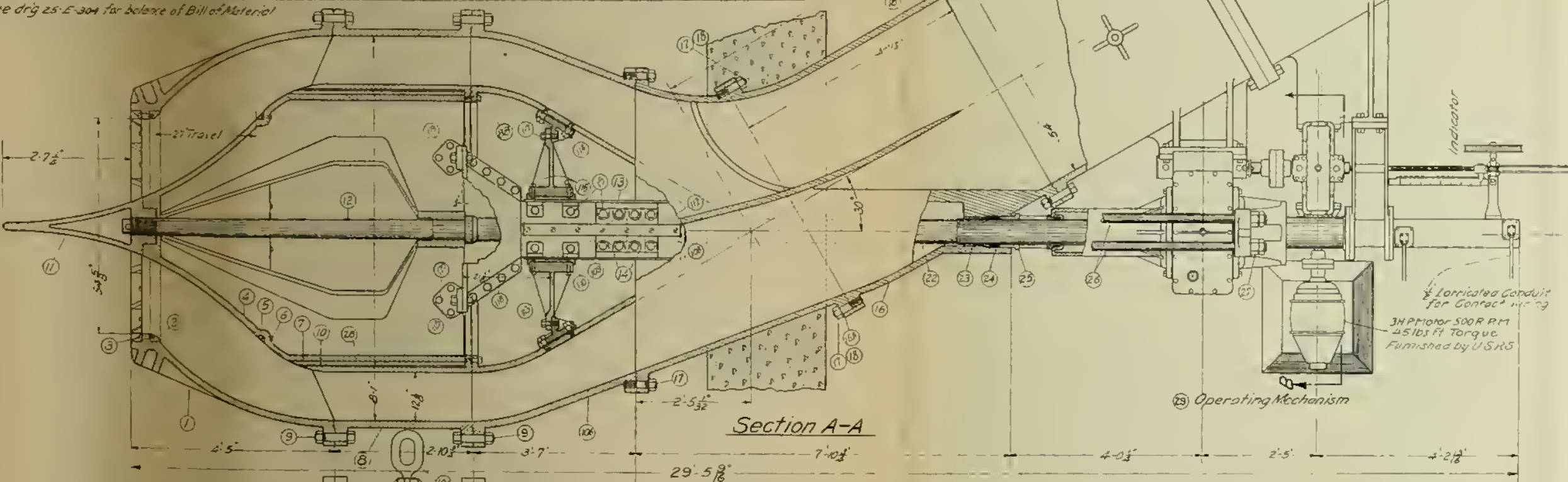
0 1 2 3 4
Scale in Feet

25-E-305

BILL OF MATERIAL FOR ONE OUTLET — THREE WANTED

Item No.	Qty.	Material	Size	Draw No.	Spec.	Name	Draw No.
1	1	Semi Steel	Needle	7E874	15	1/2" Steel with 1/4" Pin Bronze Mats	7E875
2	1	Phosphor Bronze	Needle Seal		16	30° Elbow	25-E-600
3	16	Tabin	Cap Screws		7	1/2" Steel with 1/4" Pin Bronze Mats	7E874
4	1	Semi Steel	Needle	7E875	16	1/2" bolts	
5	1	Phosphor Bronze	Needle Seal		15	54" Pipe with Grooves	7E880
6	10	Tabin	Cap Screws		20	Sole Plate	7E874
7	4	Glass C	Guide		21	1/2" Steel with 1/4" Pin Bronze Mats	
8	1	Semi Steel	Needle Case	7E875	22	Special Steel Stem-Operating Section	7E880
9	126	1/2" Steel with 1/4" Pin Bronze Mats		7E874	23	Class D Bronze Main Stem & Winding	7E876
10	1	Class D Bronze	Stem	7E874	24	1/2" Flux Packing-graphite	
11	1	Phosphor	Needle Tip	7E875	25	61 Main Stem Elbow	7E876
12	1	Special Steel	Stem-Needle Section		26	2" Tension Rods	7E876
13	1	Cast Steel	Stem Coupling	25-E-538	27	8 Tabin Bronze Tension Rod Nuts	
14	2	Steel	Ring Keyhole & 1/4" Pin Bronze	7E875	28	3/4" FH Bolts and Nuts	7E875
15	1	Semi Steel	Needle Case Cone	7E880	29	1 OPERATING MECHANISM	7E881

e drg 25-E-304 for balance of Bill of Material



- LIST OF DRAWINGS
- NO 16 30° ELBOW DETAIL
 - " 2 30° ELBOW SPLITTER SECTIONS
 - " 3 RADIAL SECTIONS 30° ELBOW
 - " 4 NEEDLE CASE DETAIL
 - " 5 NOZZLE AND SOLE PLATE DETAILS
 - " 6 NEEDLE DETAILS
 - " 7 GEAR AND THRUST CASE DETAILS
 - " 8 SQUARE BEARING AND INDICATOR DETAILS
 - " 9 THRUST BEARING, STRUT, GEAR AND NUT
 - " 10 WORM AND CASE DETAILS
 - " 11 54" PIPE WITH BRACKETS
 - " 12 OPERATING MECHANISM
 - " 13 GENERAL ARRANGEMENT
 - " 14 NEEDLE CASE CONE
 - " 15 COUPLING AND GUIDE BEARING DETAILS

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZONA
ROOSEVELT DAM
NEEDLE VALVE 54 INCH DIAMETER
NO 20353 PLATE 13 OF 88
1923

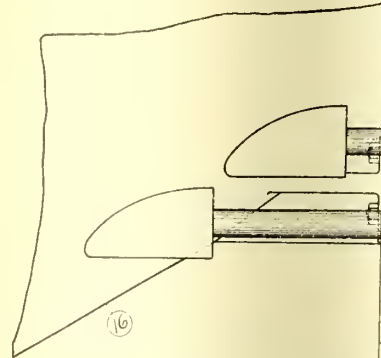
Scale in Feet
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PLATE 14

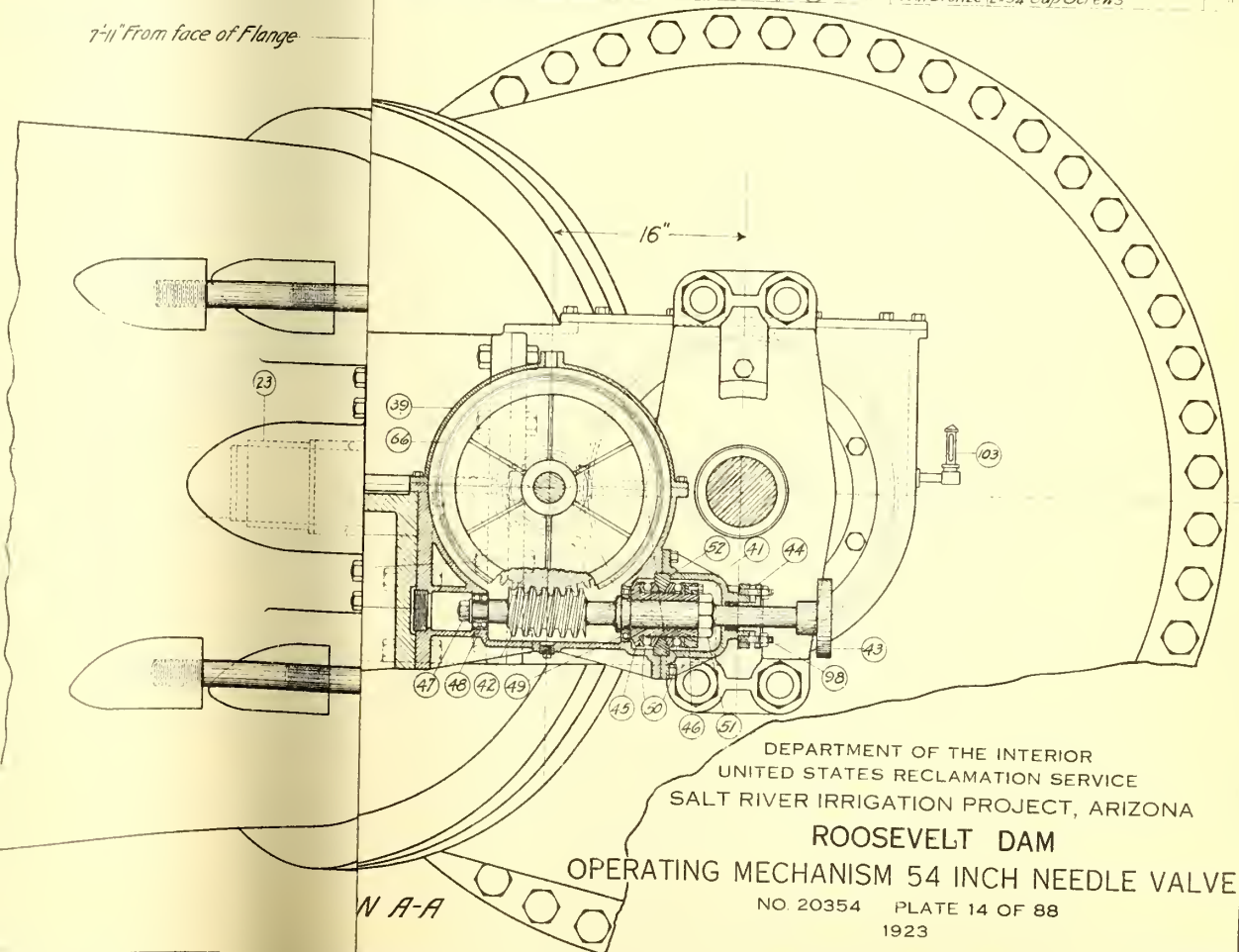
BILL OF MATERIAL CONTINUED

BILL OF MATERIAL FOR ONE OUTLET ~ THREE WANTED

Symbol	No Req'd	Material	Name	Qty	Symbol	No Req'd	Material	Name	Qty	
108	2	Class C Bronze	Coupling Guides	1	7E876	68	1	Semi Steel	Square Bearing	7E877
109	2	" " "	" " "	1		69	1	"	End Stem Case	
110	2	" " D "	Bearing Liners	1		70	2	"	Contact Box	
111	2	" " "	" " "	1		71	2	Red Wd Fibre	Contact Insulation	
112	28	Tobin Bronze	$\frac{3}{4} \times \frac{1}{2}$ FH Screws	1		72	2	Copper	Contact	
113	1	Semi Steel	Guide Bearing	1		73	2	Brass	Cover	
114	4	" " "	Bearing Brackets	1		74	2	Copper	Brushes	
115	16	" " "	Coupling	1		75	2	Brass	Terminal Posts	
116	8	Tobin Bronze	$\frac{3}{4} \times \frac{3}{8}$ Cap Screws	1	7E879	76	1	Semi Steel	Indicator Bearing	
117	36	" " "	$\frac{1}{4} \times \frac{3}{8}$ " " "	1		77	1	"	Bracket	
118	8	Steel	$\frac{1}{4} \times \frac{1}{4}$ Bolts-Tobin Bra	1		78	2	Brass	Guide Plates	
119	16	" " "	$\frac{1}{4} \times \frac{1}{4}$ " " "	1		79	1	Phos Bronze	Indicator Rack	
120	24	" " "	$1 \times \frac{1}{2}$ " " "	1		80	1	"	Pinion	
121	2	Semi Steel	Needle Case Base	1		81	1	"	Nut	
122	12	Steel	2×7 Studs with Tob	1		82	1	Brass	Stem Sheath	7E880
123	4	" " "	$\frac{1}{4} \times \frac{1}{2}$ " " "	1		83	4	Steel	$\frac{1}{4} \times \frac{1}{2}$ Bolts-Tobin Bronze Nuts	7E874
						84	13	"	1×4	
						85	8	"	$\frac{3}{4} \times \frac{1}{2}$	
						86	16	"	$\frac{3}{4} \times \frac{3}{8}$	
						87	6	"	$\frac{1}{2} \times \frac{1}{4}$	
						88	26	Tobin Bronze	$1 \times \frac{1}{2}$ Cap Screws	
						89	24	"	$\frac{1}{2} \times \frac{1}{2}$	
						90	2	"	$\frac{1}{2} \times \frac{1}{2}$	
						91	3	"	$\frac{3}{4} \times \frac{1}{2}$	
						92	8	"	$\frac{3}{4} \times \frac{1}{2}$	
						93	8	"	$\frac{3}{4} \times \frac{1}{2}$	
						94	8	"	$\frac{3}{4} \times \frac{1}{2}$	
						95	8	"	$\frac{3}{4} \times \frac{1}{2}$	
						96	8	"	$\frac{3}{4} \times \frac{1}{2}$	
						97	4	Steel	$\frac{3}{4} \times \frac{1}{2}$ Studs-Tobin Bronze Nuts	
						98	3	"	$\frac{3}{4} \times \frac{1}{2}$	
						99	8	"	$\frac{3}{4} \times \frac{1}{2}$ Bolts	
						100	4	Brass	$\frac{1}{4} \times \frac{1}{4}$ Oil Cups	
						101	2	"	$\frac{1}{4} \times \frac{1}{4}$ Grease Cups	7E877
						102	60	Flax	$\frac{3}{4}$ Sg Hydraulic Packing	7E876 79
						103	2	Brass	$\frac{3}{4}$ Oil Gauges-See Note with 30	7E876 79
						104	2	Mild Steel	2 Eye Bolt	7E874
						105	1	"	"	
						106	2	Tobin Bronze	$1 \times \frac{1}{2}$ Cap Screws	



7-11" From face of Flange



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZONA

ROOSEVELT DAM
OPERATING MECHANISM 54 INCH NEEDLE VALVE

NO 20354 PLATE 14 OF 88
1923

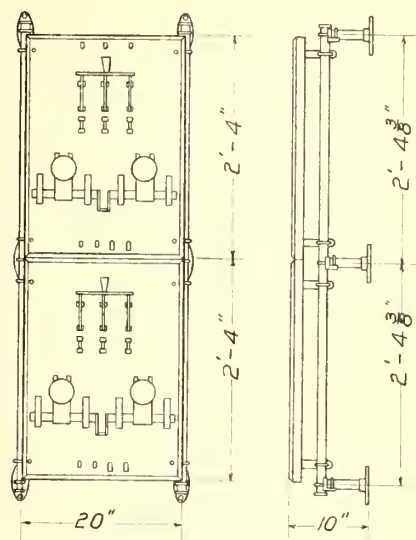
OF MATERIAL CONTINUED

Material	Name	Qty.	Org. No.
Cast Bronze	Coupling Bush	25 E-298	
D	Bearing Liners		
Cast Bronze	1/2" F.H. Screws		
Cast Steel	Guide Bearing		
	Bearing Brackets		
	Coupling		
Cast Bronze	1/2" F.H. Cap Screws	25 E-297	
	1/2" F.H.		
Steel	1/4" Bolts with Cast Bronze Nuts		
	1/2" F.H.		
Semi Steel	Needle Case Base Plate	25 E-296	
Steel	2" x 7" Studs with Cast Bronze Nuts	25 E-297	
	1/2" F.H.		

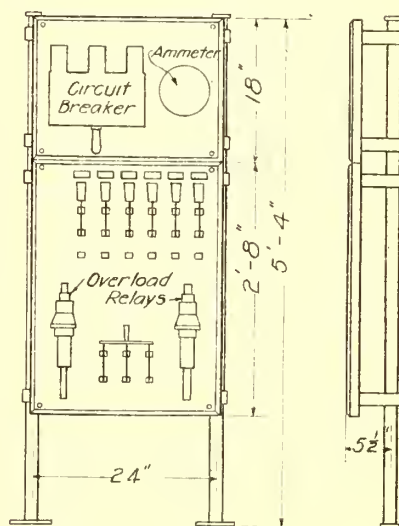
- LIST OF DRAWINGS
- NO 10 30° ELBOW DETAIL
 - 2 30° ELBOW SPLITTER SECTIONS
 - 3 RADIAL SECTIONS 30° ELBOW
 - 4 NEEDLE CASE DETAIL
 - 5 NOZZLE AND SOLE PLATE DETAILS
 - 6 NEEDLE DETAILS
 - 7 GEAR AND THRUST CASE DETAILS
 - 8 SQUARE BEARING AND INDICATOR DETAILS
 - 9 THRUST BEARING STRUT, GEAR AND NUT
 - 10 WORM AND GEAR DETAILS
 - 11 54 PIPE WITH BRACKETS
 - 12 OPERATING MECHANISM
 - 13 GENERAL ARRANGEMENT
 - 14 NEEDLE CASE CONE
 - 15 COUPLING AND GUIDE BEARING DETAILS

29 BILL OF MATERIAL FOR ONE OUTLET — THREE WANTED

Symbol	Qty.	Material	Name	Qty.	Symbol	Qty.	Material	Name	Qty.
30	1	Semi Steel	1/2" F.H. Case	1	48	1	Semi Steel	Square Bearing	1
31	1		Gear Case Cover	1	49	1		End Stem Case	1
32	1	Cast Steel	Thrust Case	1	50	2	Radial Fibre	Contact Box	1
33	1	Phos Bronze	2 1/2" Bushing	1	51	2	Radial Fibre	Contact Insulation	1
34	1		3/4"	1	52	2	Copper	Contact	1
35	1		1/2"	1	53	2	Brass	Cover	1
36	1	Steel	1/2" O.D. Casing	1	54	2	Copper	Brushes	1
37	1	Cast Iron	6 1/2" x 5 1/2" Flange	1	55	2	Brass	Terminal Pins	1
38	1	Semi Steel	Worm Drive Case	1	56	1	Semi Steel	Indicator Bearing	1
39	1		Cover	1	57	1		Bracket	1
40	1	Cast Iron	3" Std. Pipe Plug	1	58	2	Brass	Guide Plates	1
41	1	Semi Steel	Worm Bearing Housing	1	59	1	Phos Bronze	Indicator Rock	1
42	1	Steel	Worm	1	60	1		Pinion	1
43	1	Cast Iron	Std. Flexible Coupling	1	61	1		Nut	1
44	1	C. Bronze	1 1/2" Gland	1	62	1	Brass	Stem Sheath	1
45	1	Steel	Worm Thrust Sleeve	1	63	4	Steel	1 1/2" Bolt's Cast Bronze Nuts	1
46	1		Sleeve Nut	1	64	1		1/4"	1
47	1		1" Lock Nut	1	65	8		1/4"	1
48	1		3/4" Worm Shaft Bearing	1	66	6		1/4"	1
49	1		1/2"	1	67	6		1/4"	1
50	2		1/2" Thrust	1	68	26	John Brown	1 1/2" Cap Screws	1
51	1		2 1/2" Lock Nut	1	69	24		1 1/2"	1
52	1		Thrust Ring	1	70	2		1 1/2"	1
53	1	Brass	Indicator Drum Shaft	1	71	2		1 1/2"	1
54	1	Phos Bronze	Indicator	1	72	8		1 1/2"	1
55	1		Stem	1	73	8		1 1/2"	1
56	1	Semi Steel	Drum	1	74	8		1 1/2"	1
57	2	Brass	Straps	1	75	8		1 1/2"	1
58	1	Cast Steel	Gear	1	76	8		1 1/2"	1
59	1	Cast Steel	Nut	1	77	8		1 1/2"	1
60	2	See Detail	Roller Thrust Bearing	1	78	8		1 1/2"	1
61	1	Steel	Pinion	1	79	8		1 1/2"	1
62	1	Cast Steel	Thrust Bearing Strut	1	80	8		1 1/2"	1
63	1	Steel	Pinion Shaft	1	81	8		1 1/2"	1
64	1		Worm Wheel Shaft	1	82	8		1 1/2"	1
65	1	Cast Iron	Std. Flanged Coupling	1	83	8		1 1/2"	1
66	1	Cast Bronze	Worm Wheel	1	84	8		1 1/2"	1
67	1	C. Bronze	1 1/2" Gland	1	85	8		1 1/2"	1
68	1			1	86	8		1 1/2"	1
69	1			1	87	8		1 1/2"	1
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168	1			1	186	8		1 1/2"	1
169	1			1	187	8		1 1/2"	1
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MOTOR CONTACTOR PANEL
IN VALVE HOUSE
(One for each Needle Valve)

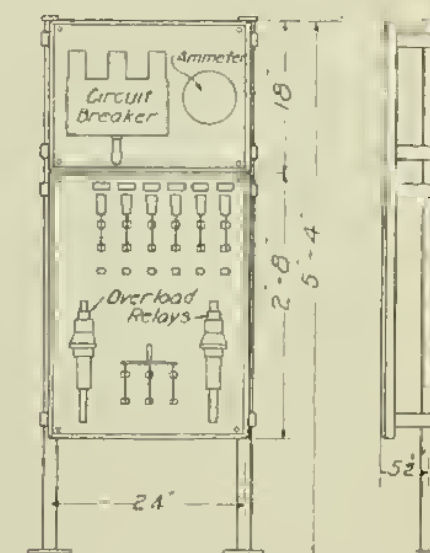
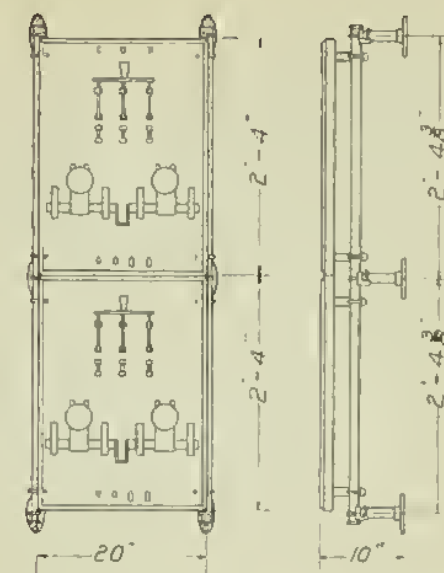
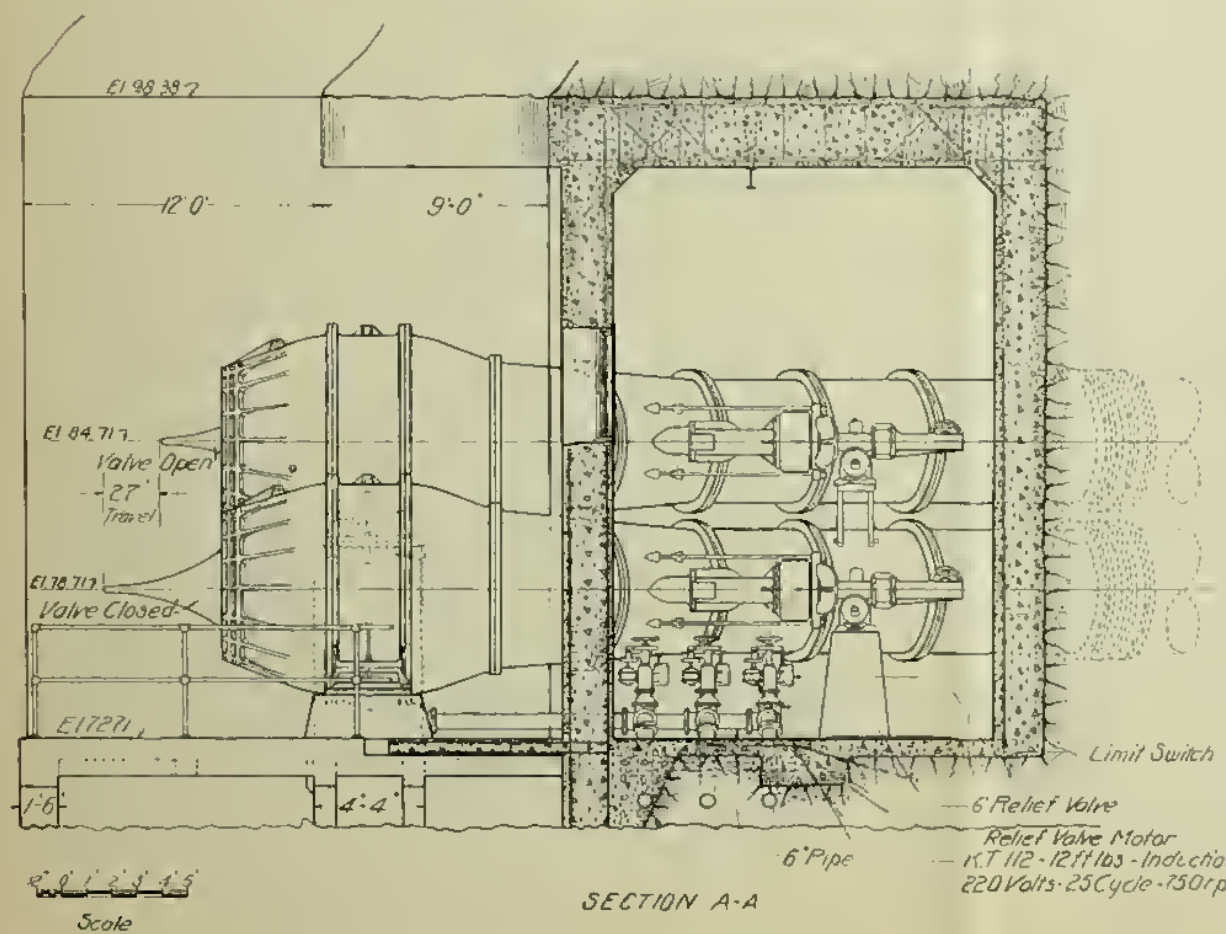
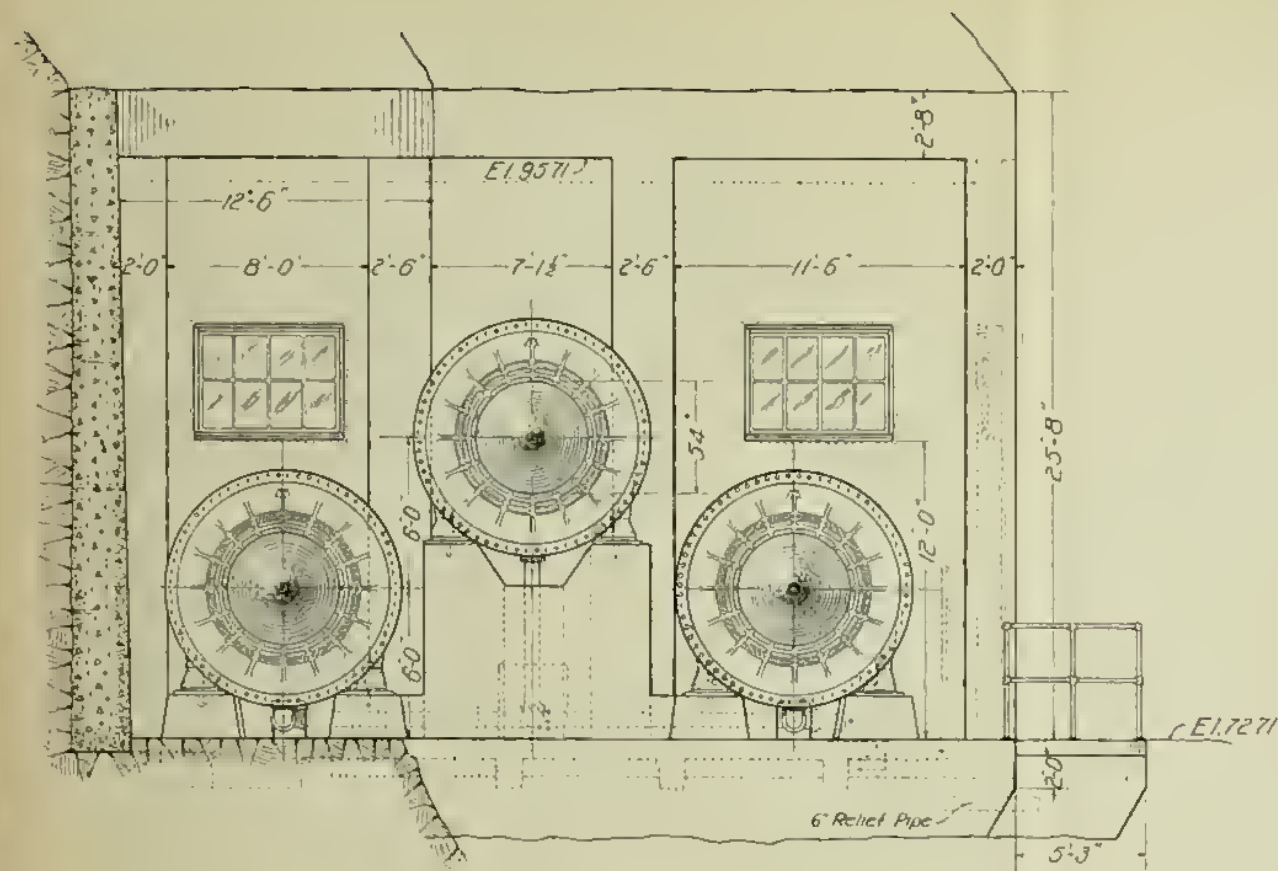
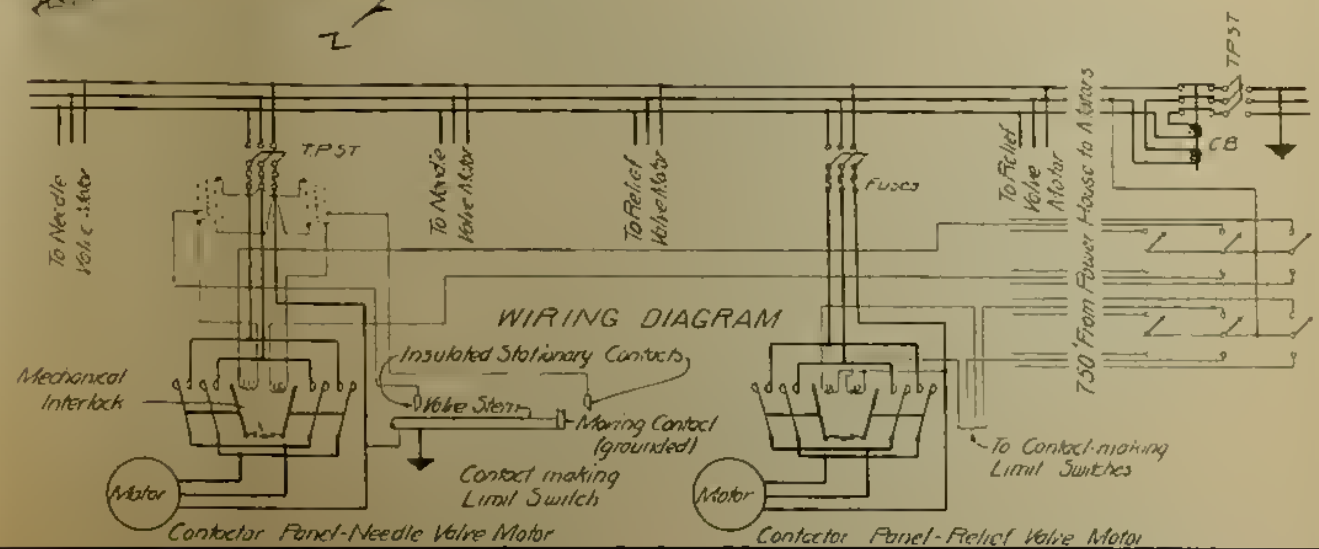
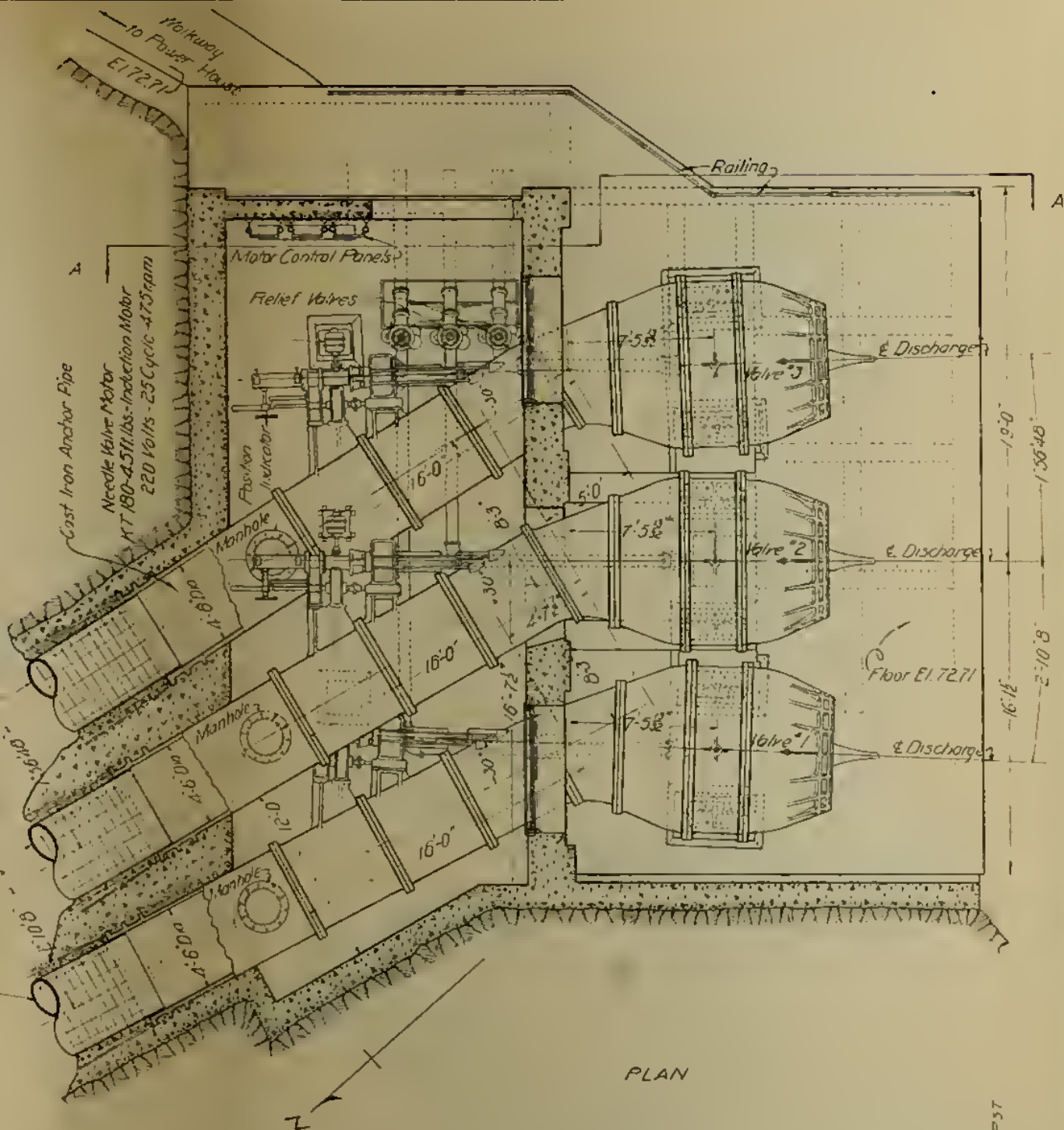


MASTER CONTROL PANEL
IN POWER HOUSE



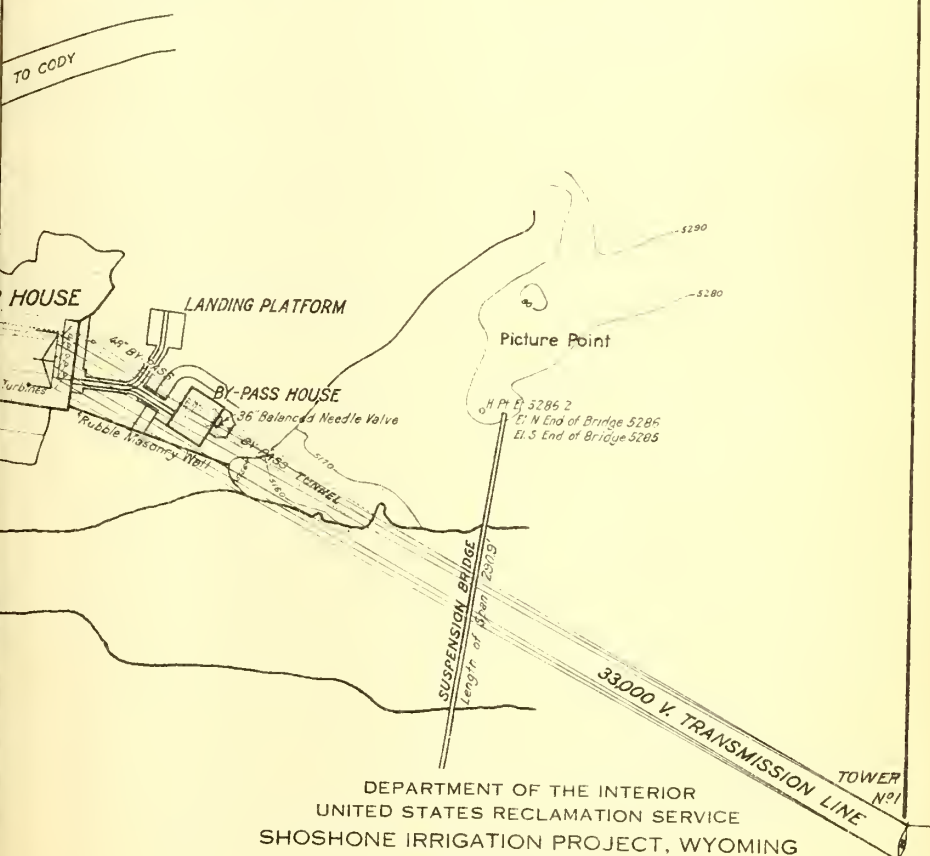
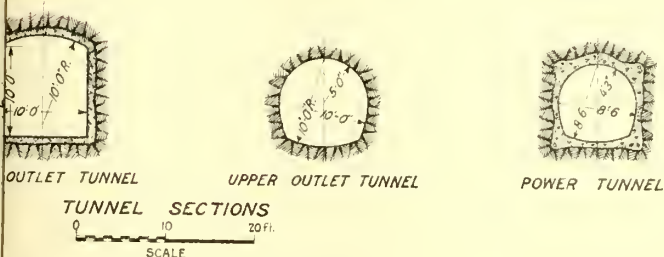
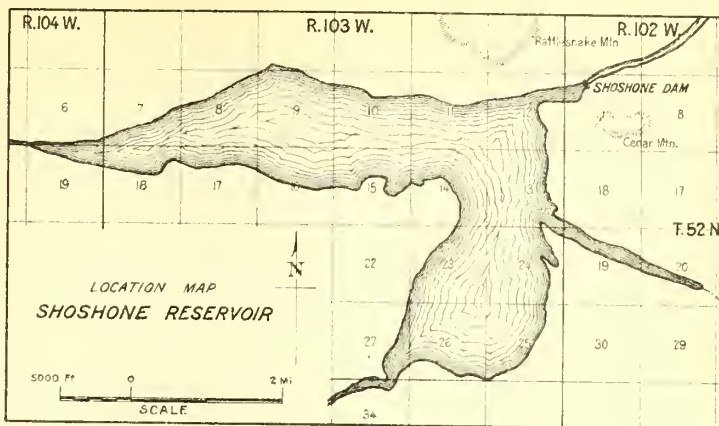
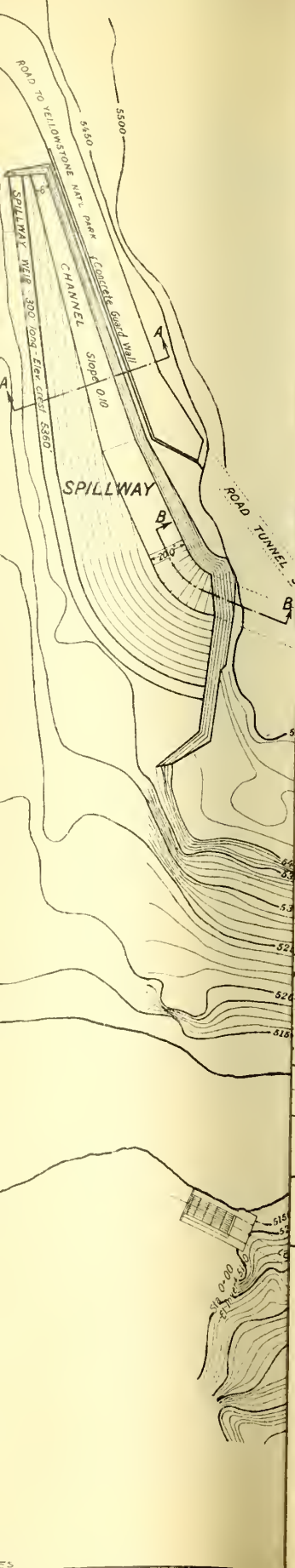
ROOSEVELT DAM INSTALLATION 54 INCH NEEDLE VALVE

NO. 20355 PLATE 15 OF 88
1923

MASTER CONTROL PANEL
IN POWER HOUSE

12' 8" 6" 3" 0"
Scale

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SALT RIVER IRRIGATION PROJECT, ARIZONA
ROOSEVELT DAM
INSTALLATION 54 INCH NEEDLE VALVE
NO 20355 PLATE 15 OF 88
1923

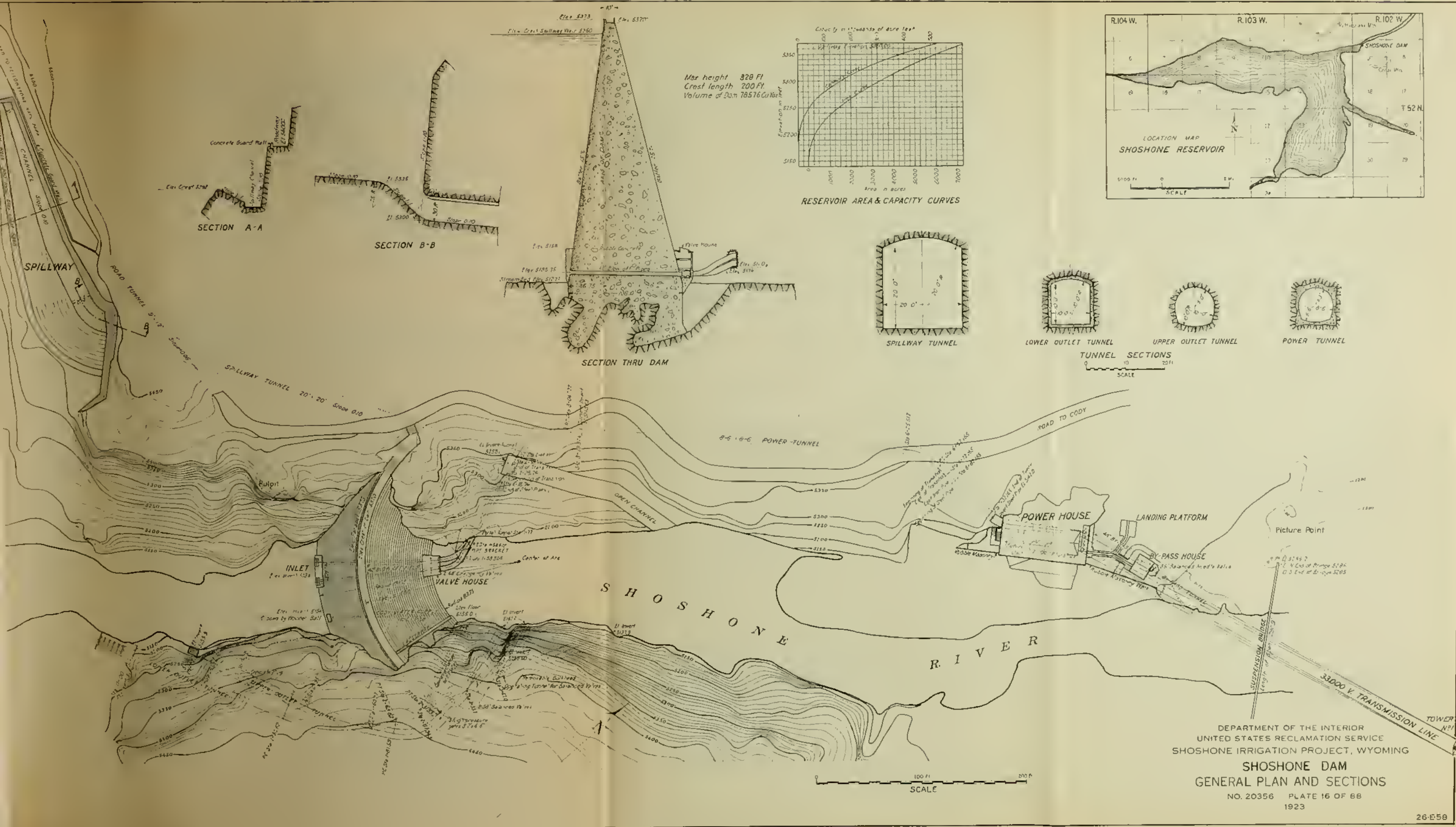


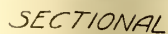
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SHOSHONE IRRIGATION PROJECT, WYOMING

SHOSHONE DAM

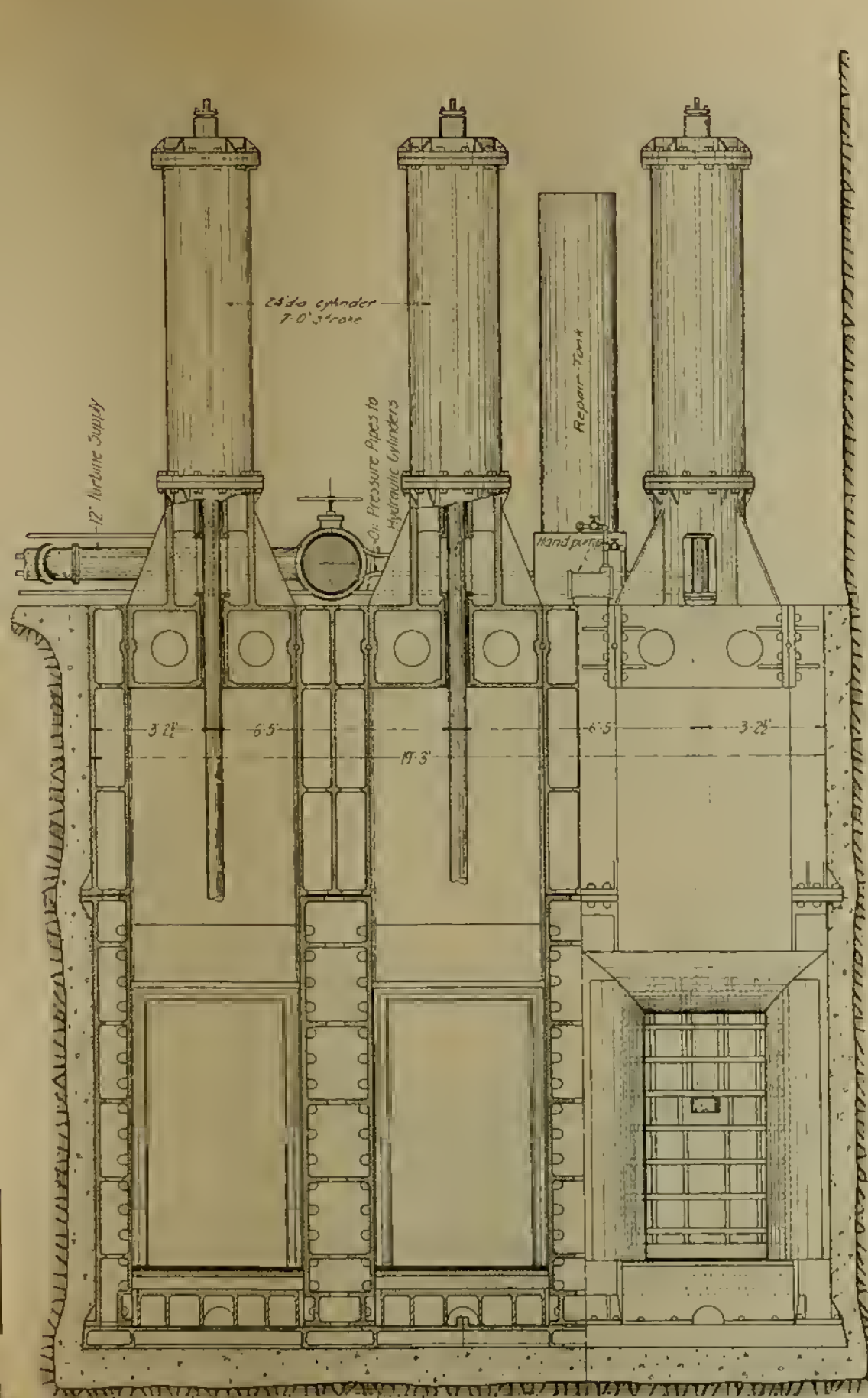
GENERAL PLAN AND SECTIONS

NO. 20356 PLATE 16 OF 88
1923



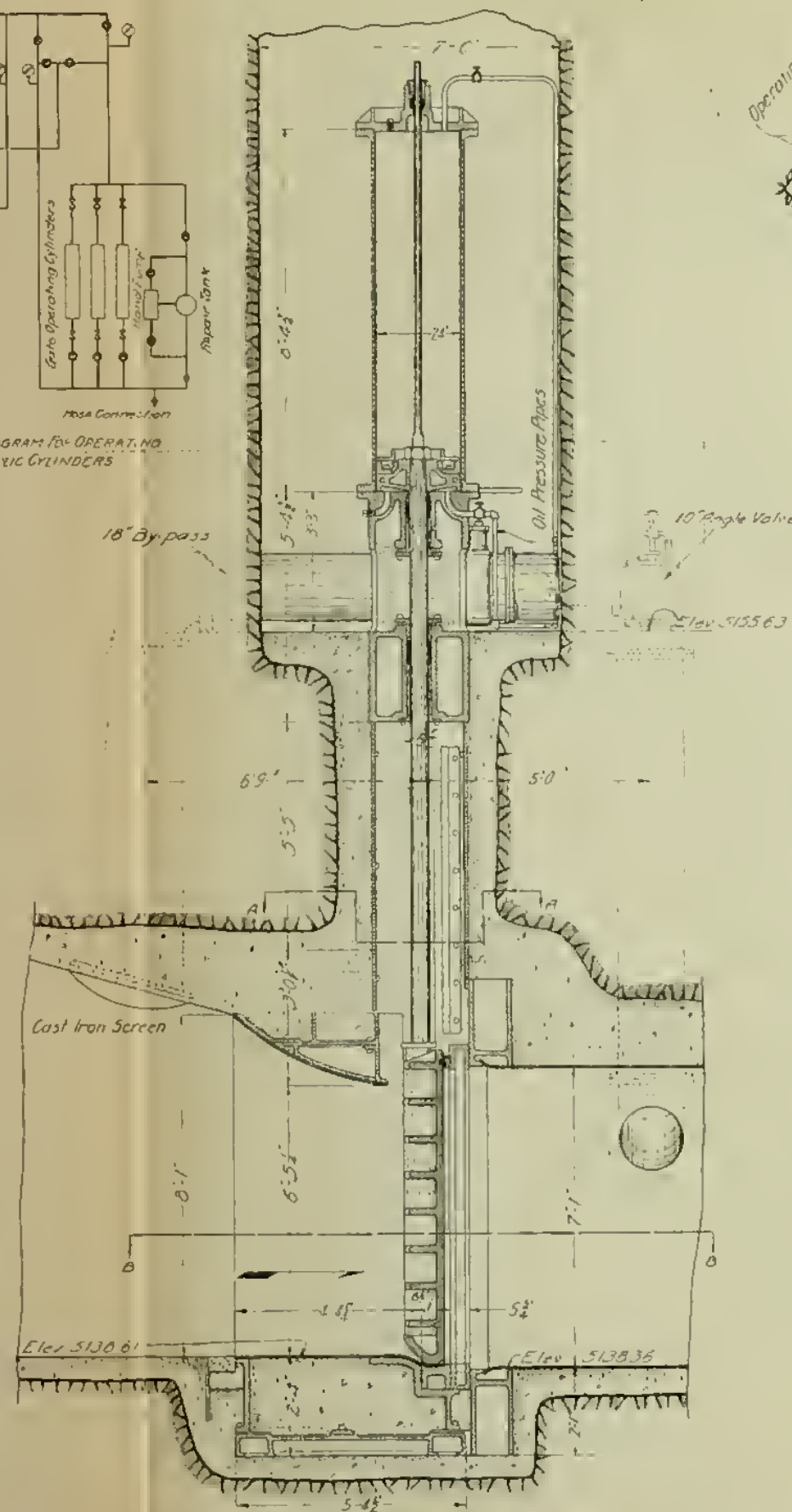
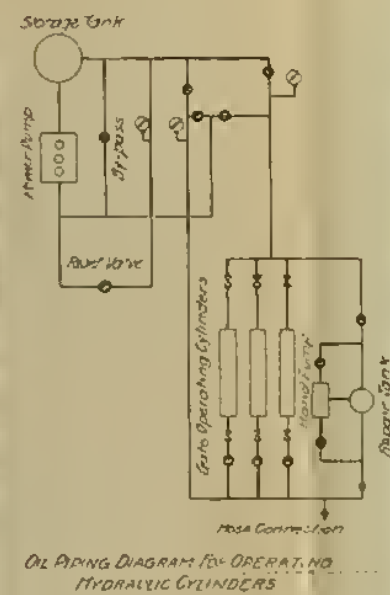


NO. 20357 PLATE 17 OF 88
1923

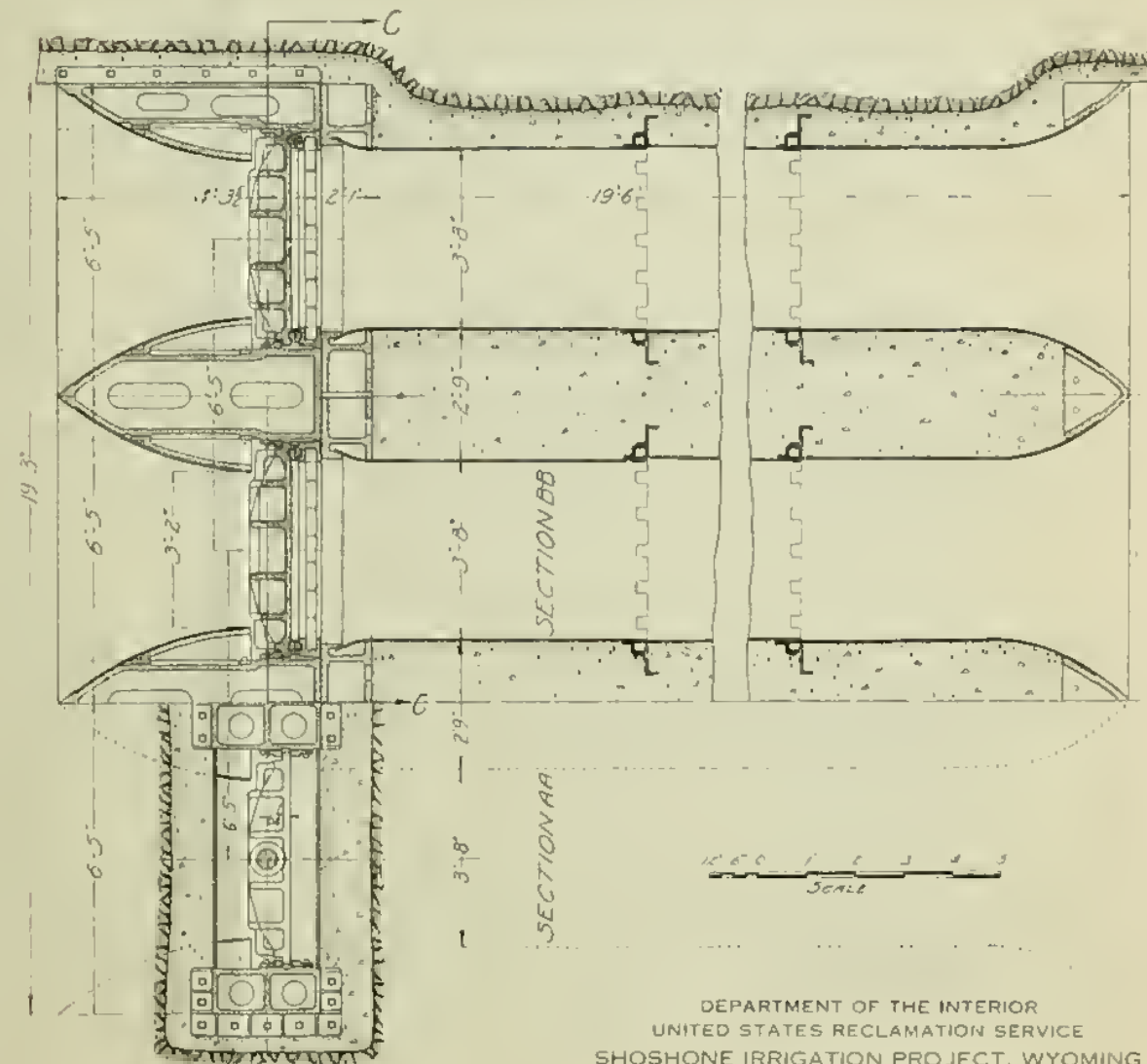
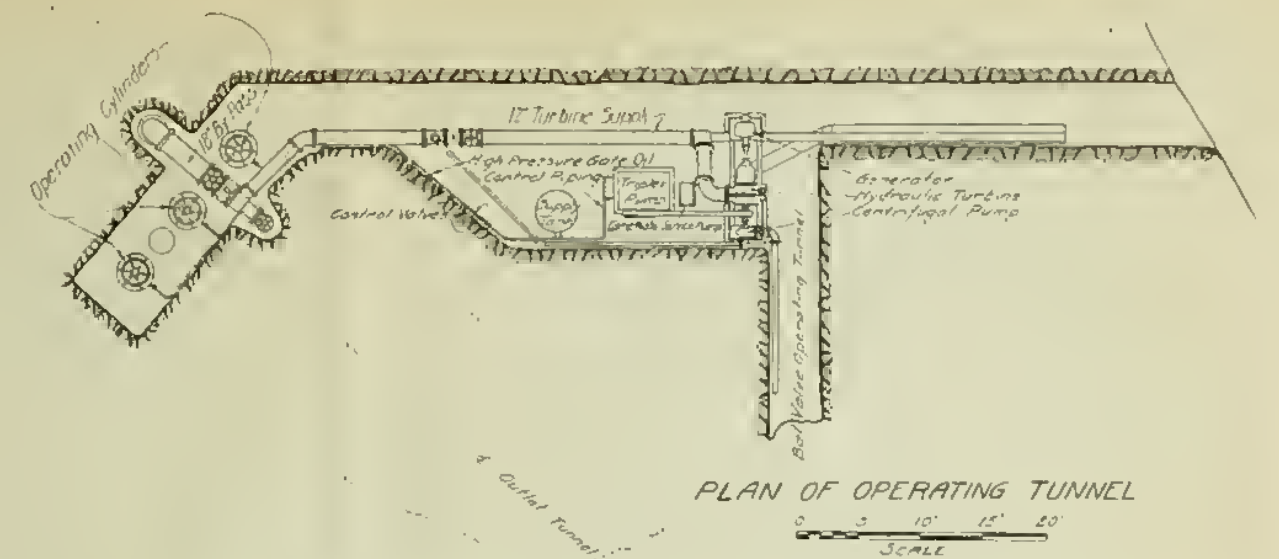


SECTIONAL ELEVATION CC

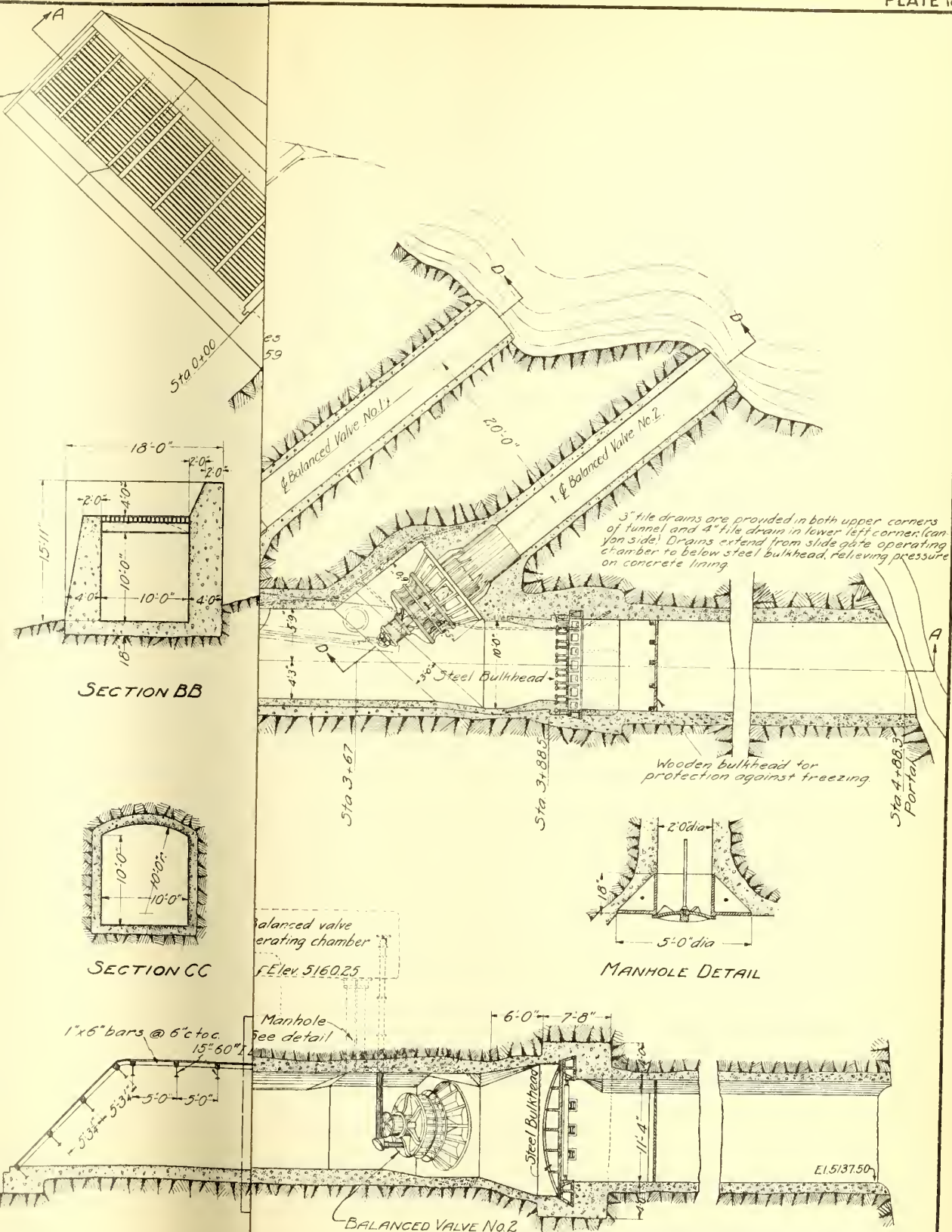
FRONT ELEVATION



SECTIONAL ELEVATION



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SHOSHONE IRRIGATION PROJECT, WYOMING
SHOSHONE DAM
HIGH PRESSURE GATES
NO 20357 PLATE 17 OF 88
1923

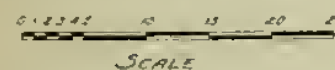


DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SHOSHONE IRRIGATION PROJECT, WYOMING

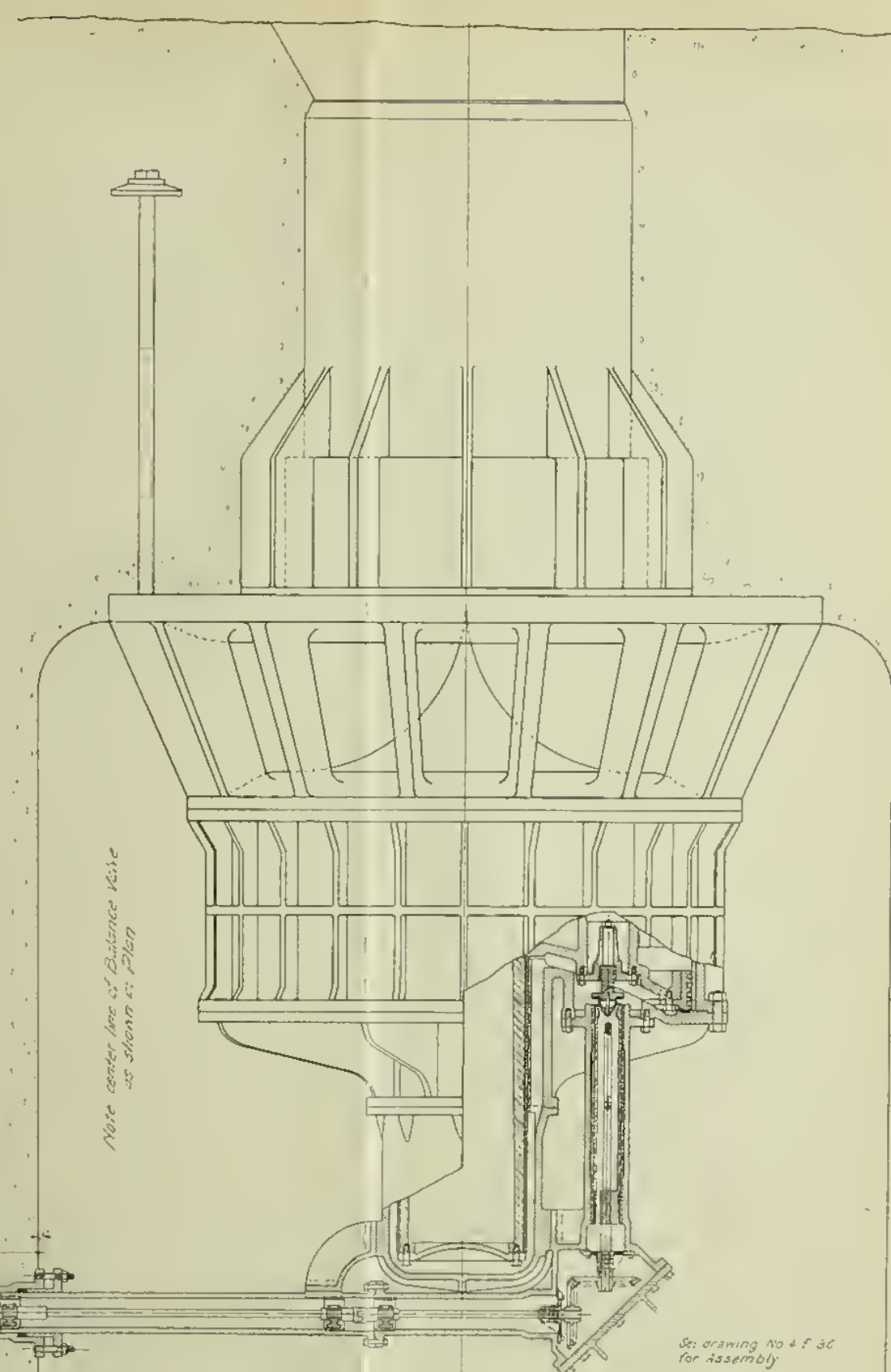
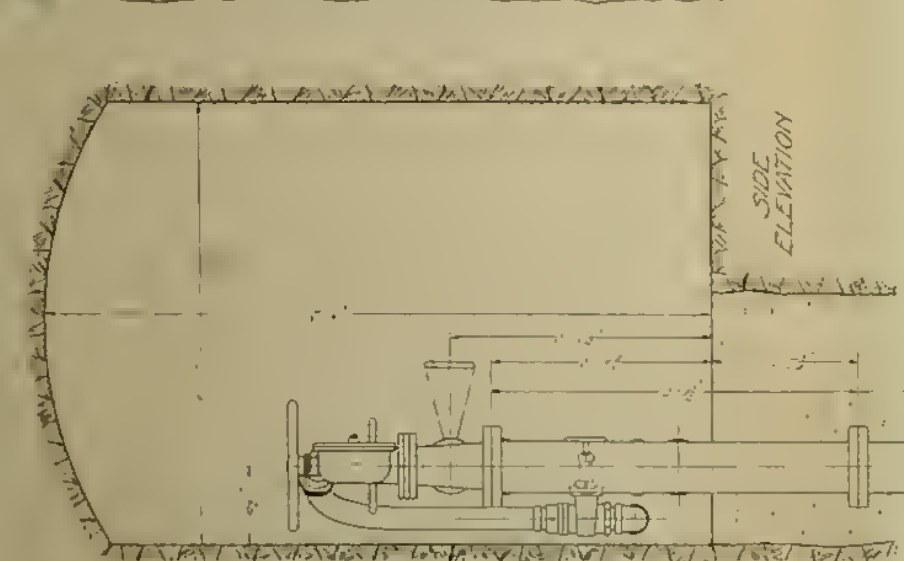
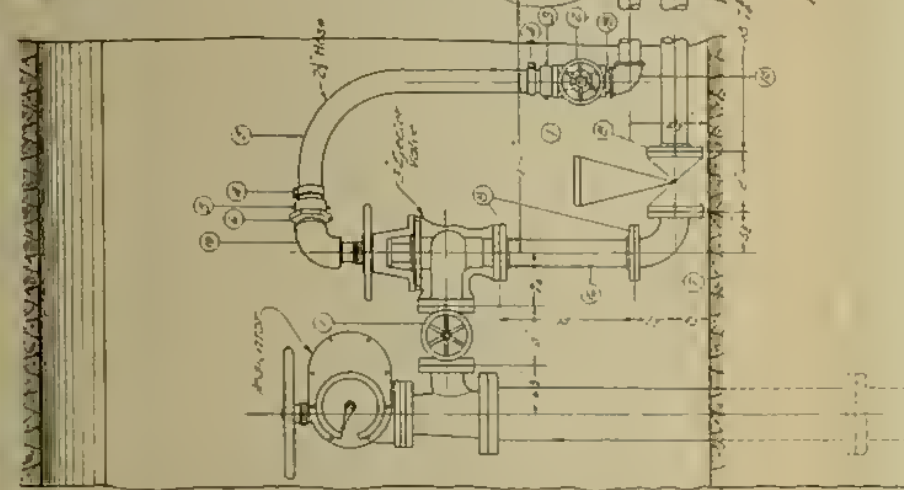
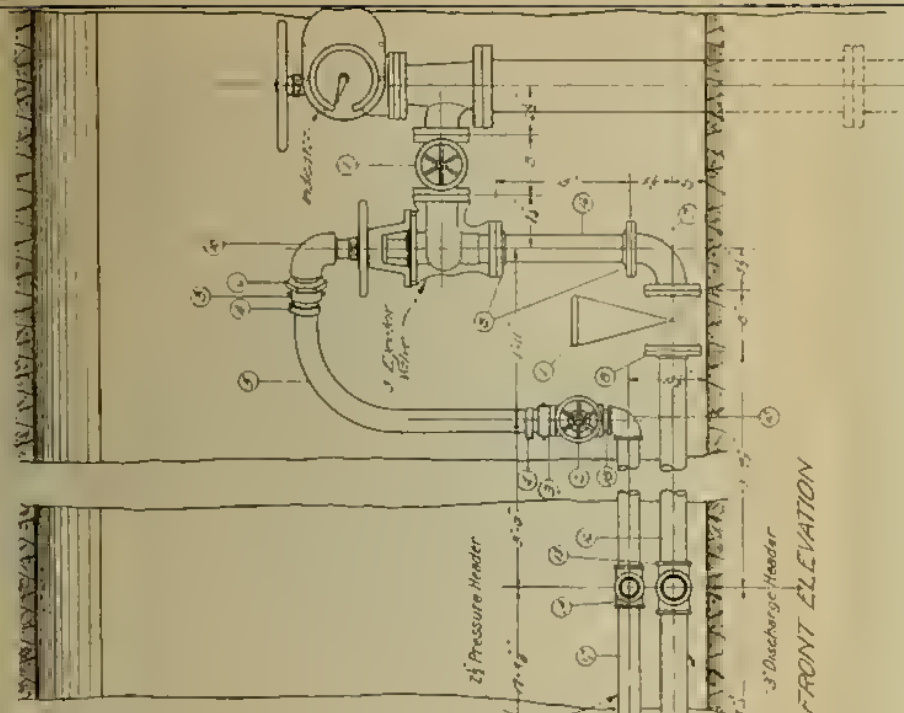
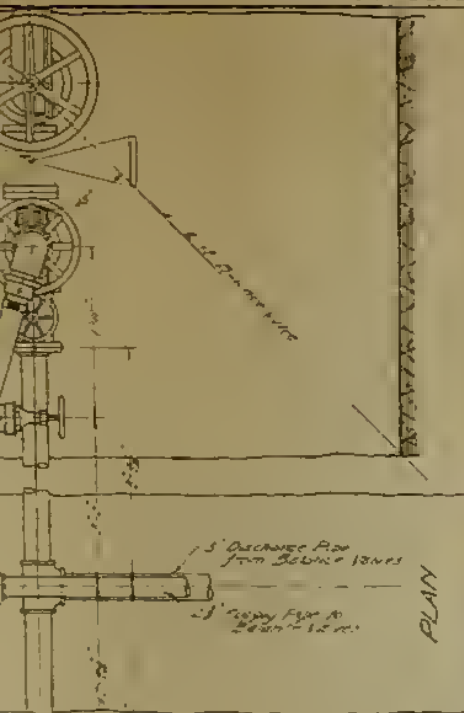
SHOSHONE DAM LOWER OUTLET TUNNEL

NO. 20358 PLATE 18 OF 88
1923

General arrangement of dam and
see drg 26-E-58.



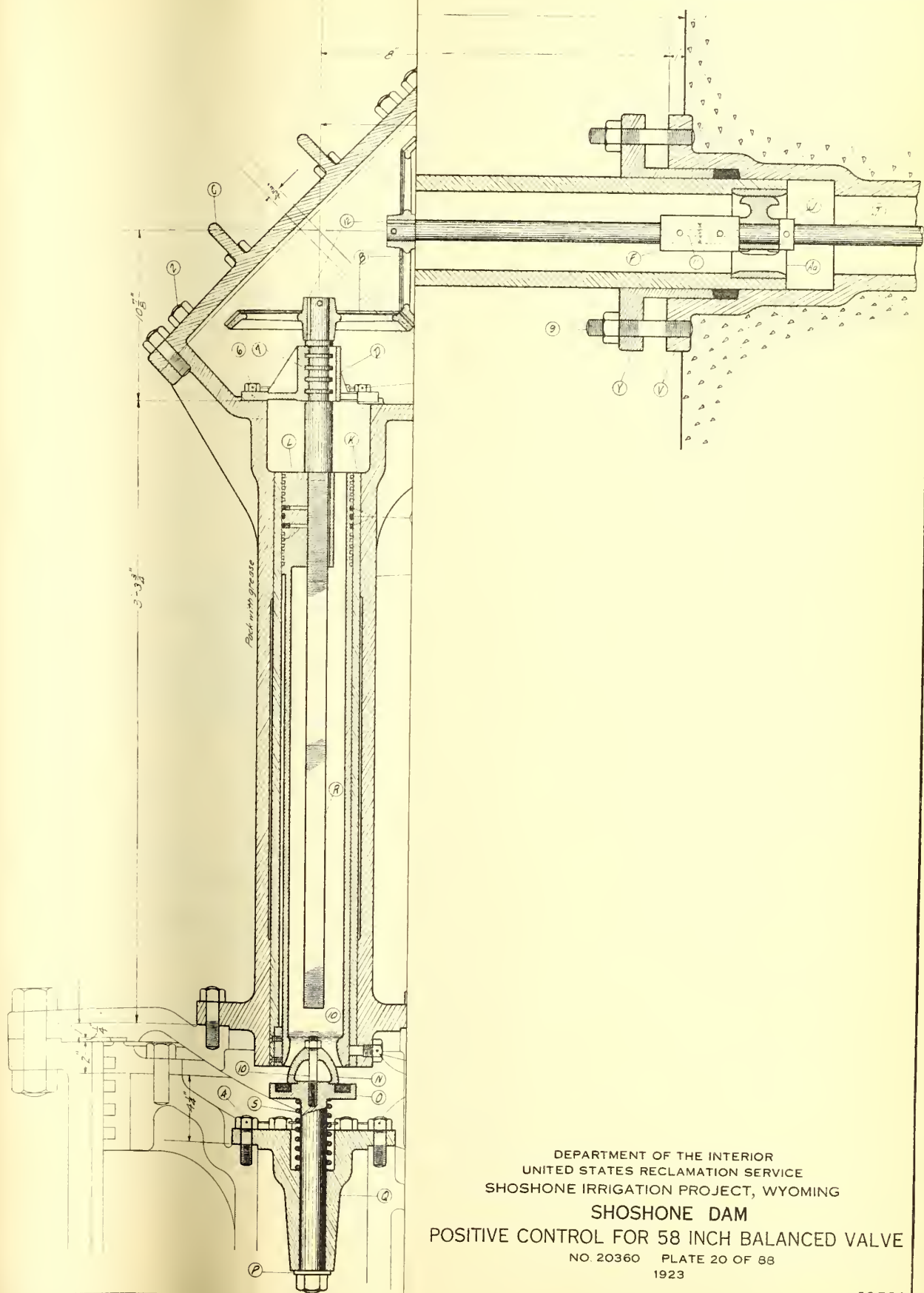
For general arrangement of dam and outlets see drg 26-E-58

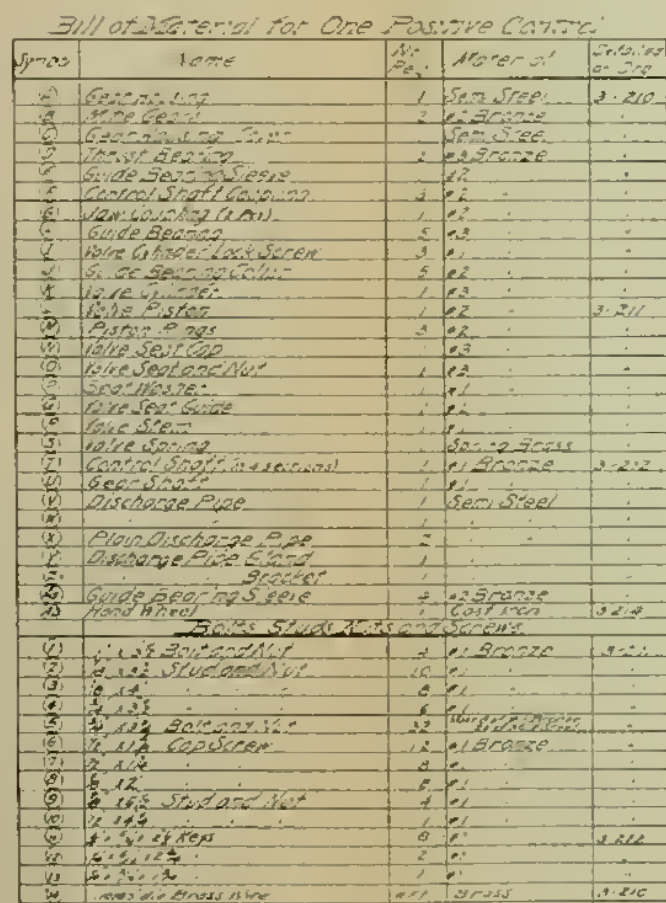


SCALE

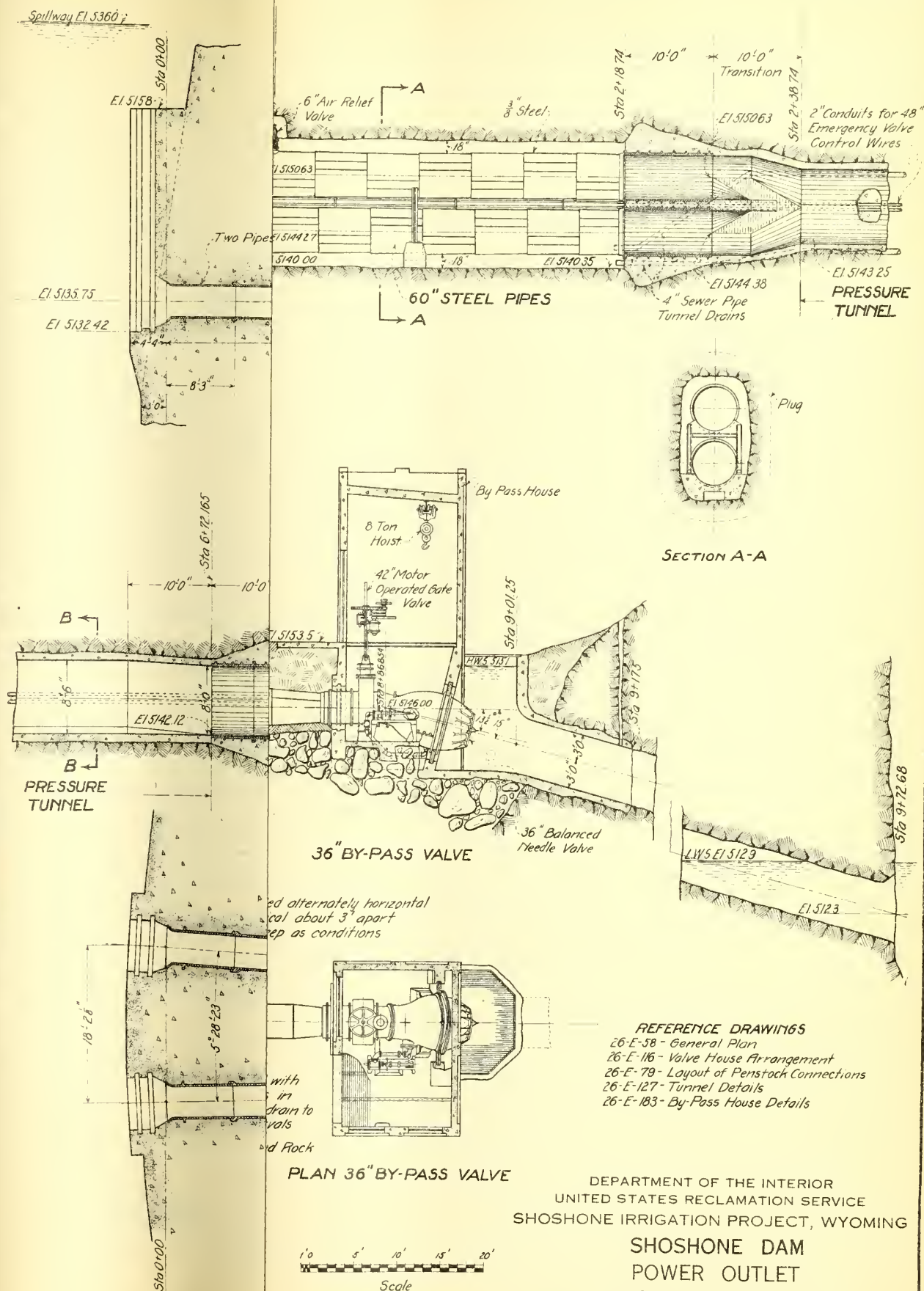
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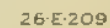
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SHOSHONE IRRIGATION PROJECT WYOMING
SHOSHONE DAM
INSTALLATION, 58 INCH BALANCED VALVE
NO 20359 PLATE 19 OF 88
1923

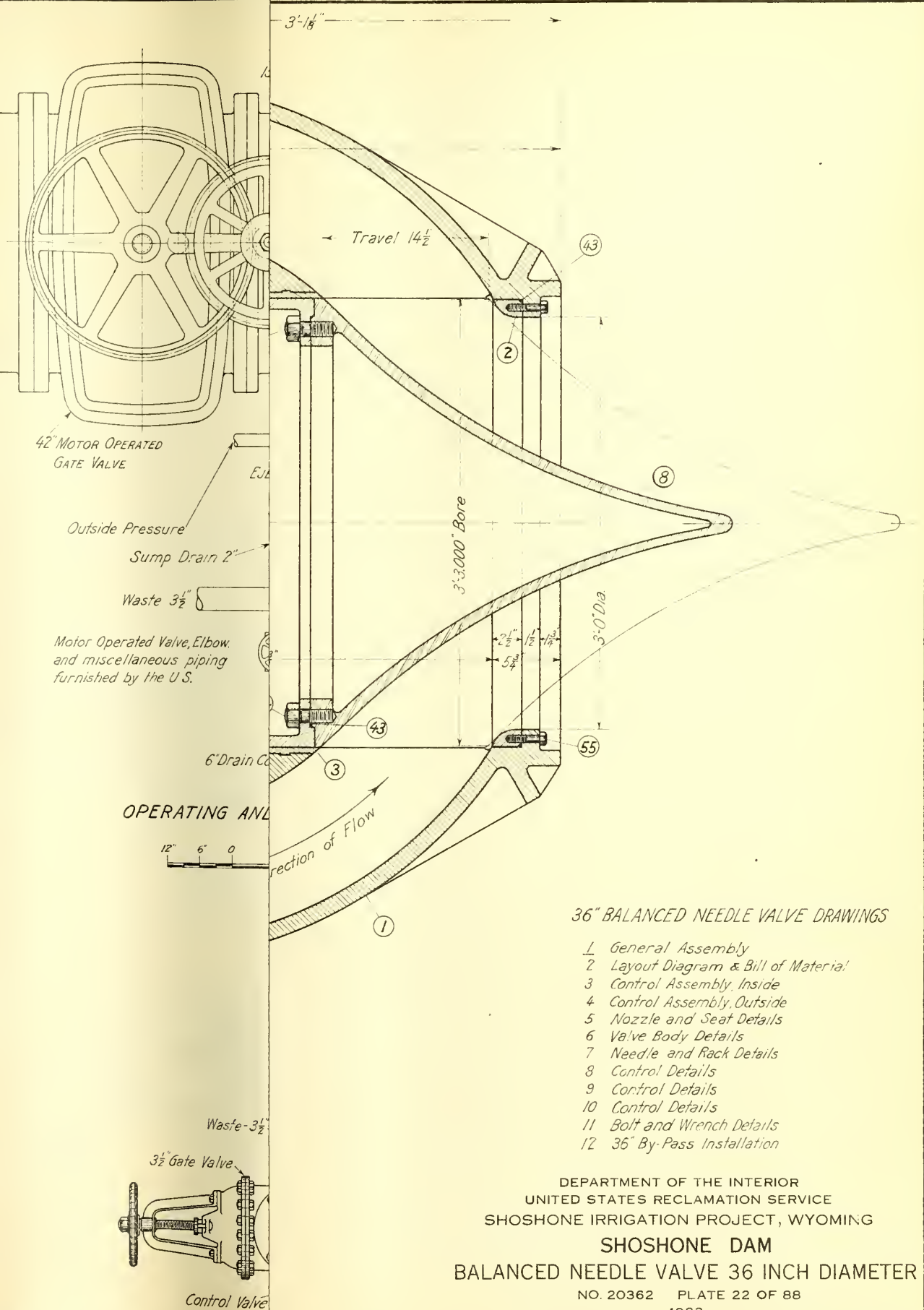


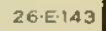


DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SHOSHONE IRRIGATION PROJECT, WYOMING
SHOSHONE DAM
POSITIVE CONTROL FOR 58 INCH BALANCED VALVE
NO 20360 PLATE 20 OF 88
1923

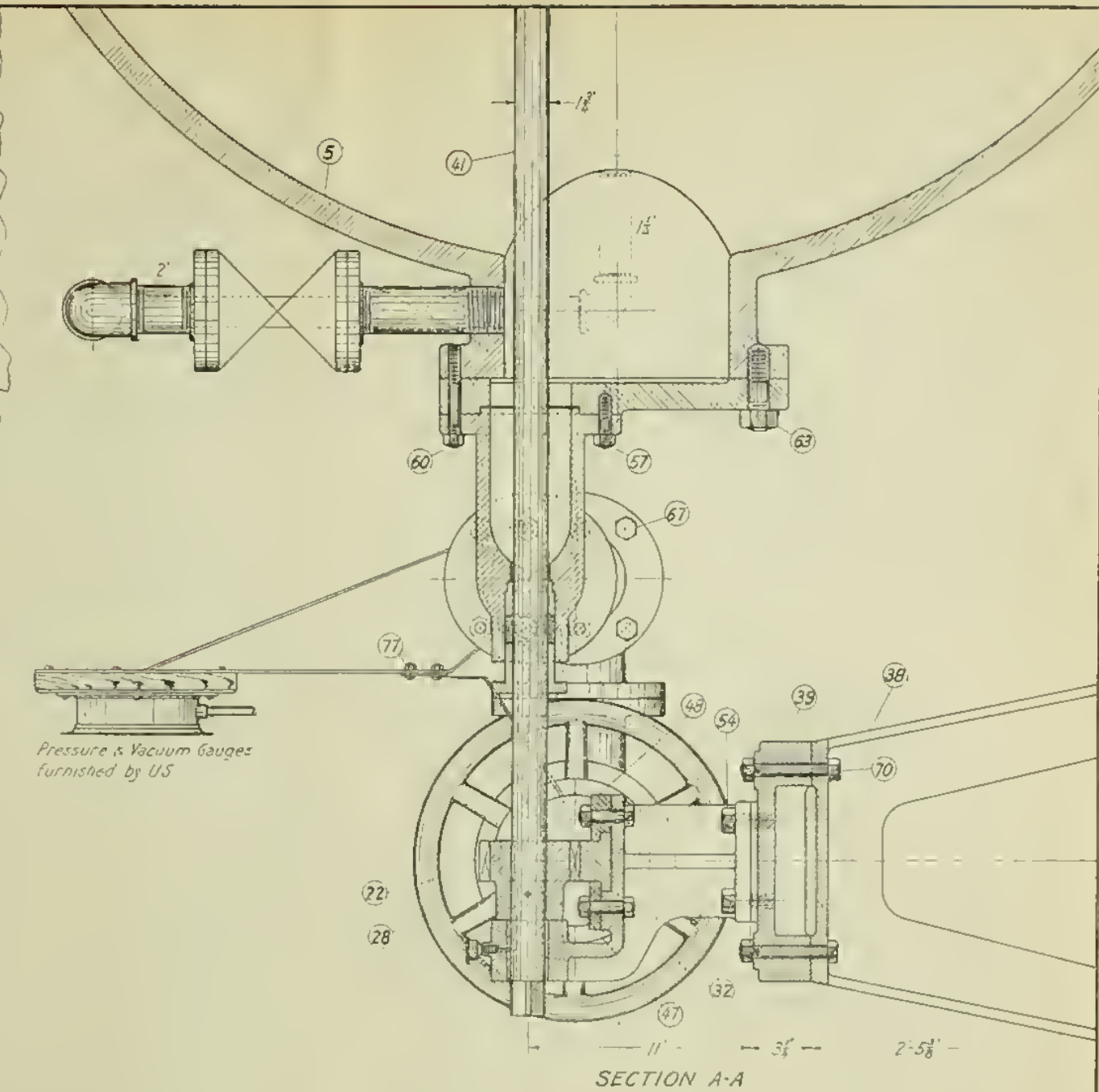
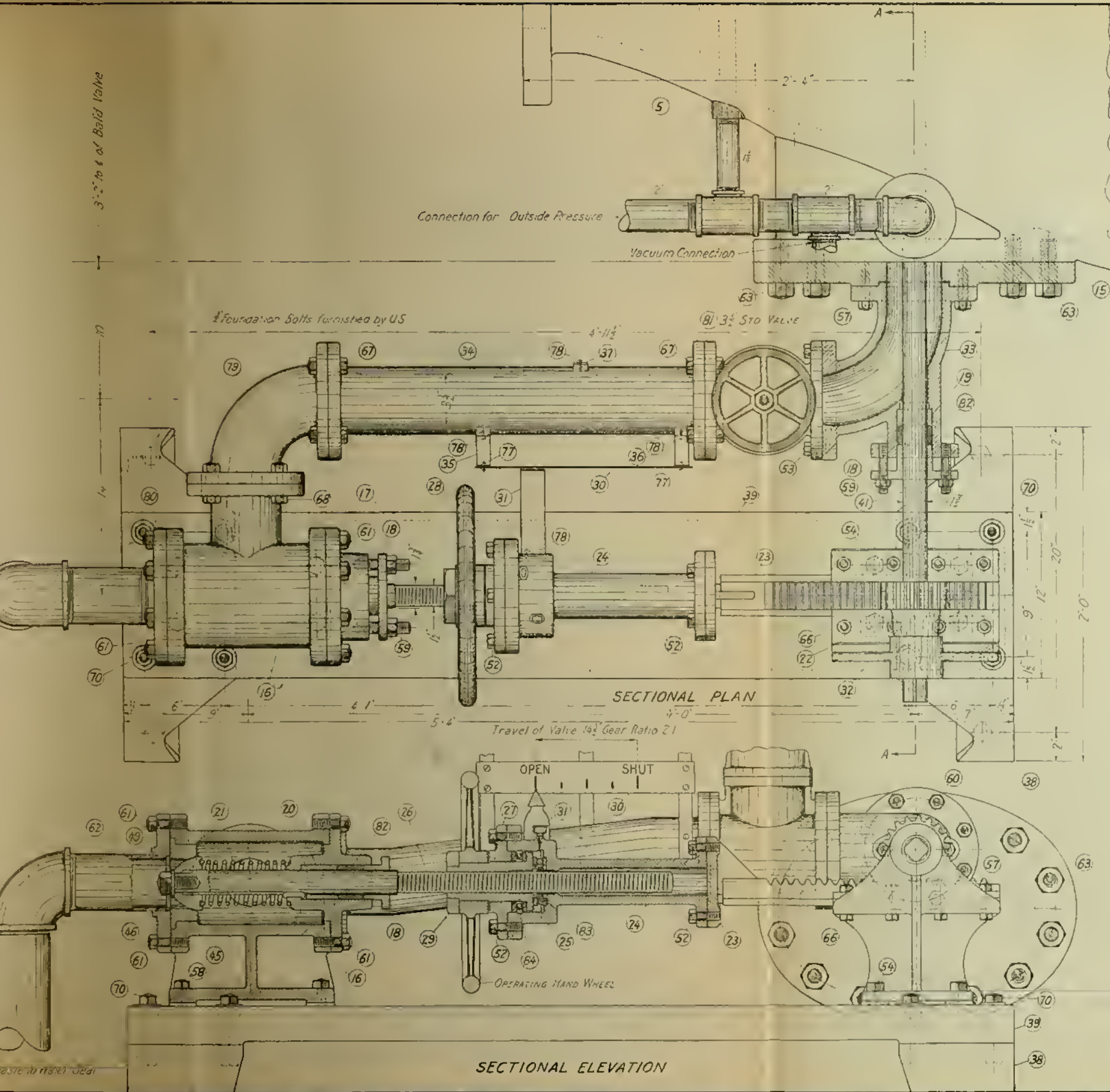












36" BALANCED NEEDLE VALVE DRAWINGS

1. General Assembly
2. Layout Diagram & Bill of Material
3. Control Assembly, Inside
4. Control Assembly Outside
5. Needle and Seat Details
6. Valve Body Details
7. Needle & Rack Details
8. Control Details
9. Control Details
10. Control Details
11. Bolt and Wrench Details
12. 36" by Pass Installation

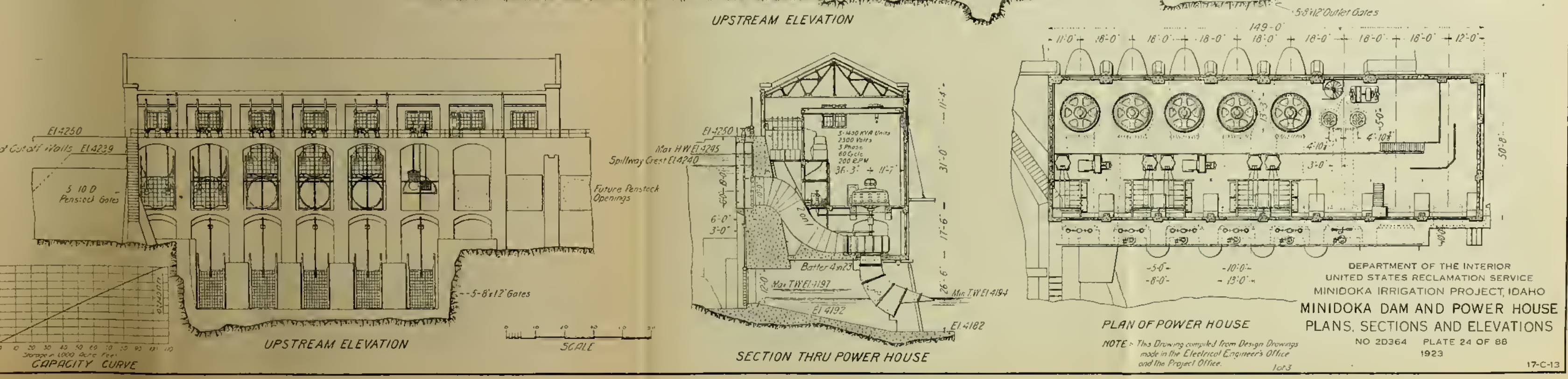
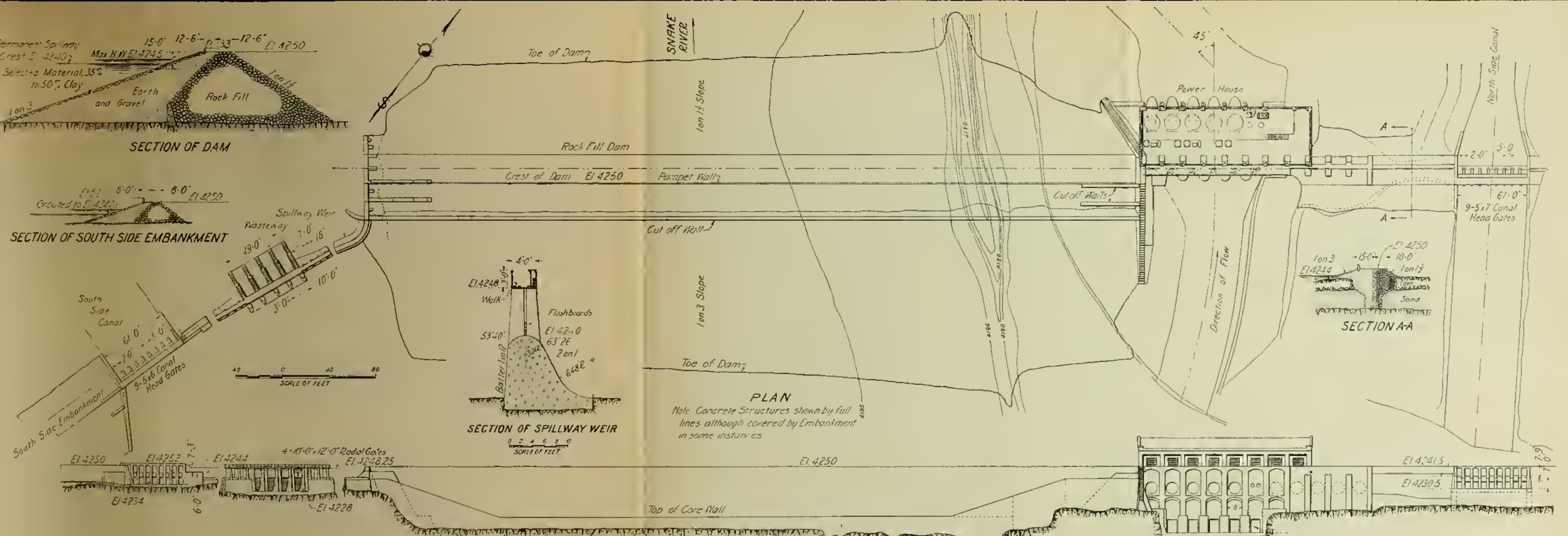
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
SHOSHONE IRRIGATION PROJECT, WYOMING

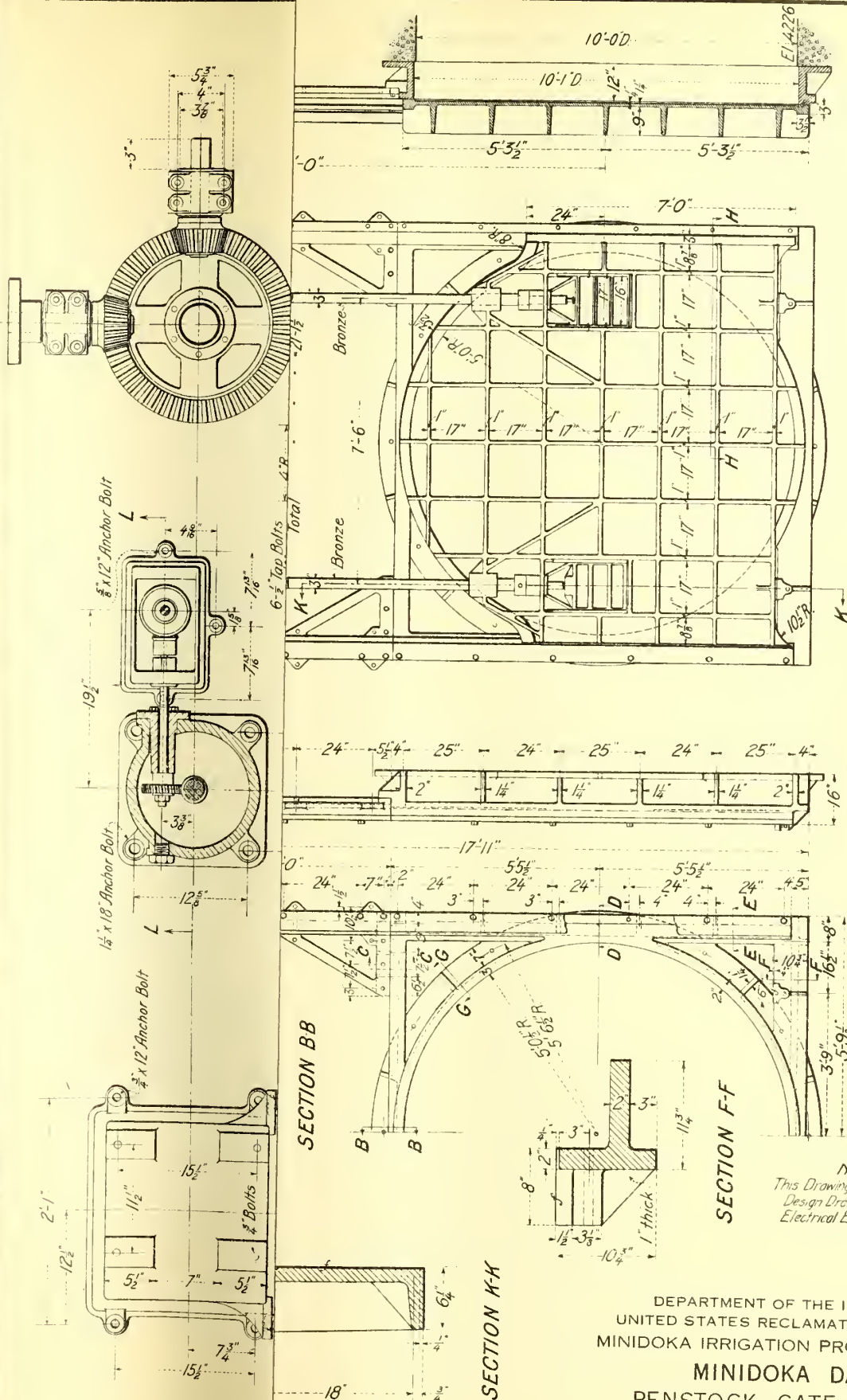
SHOSHONE DAM

CONTROL FOR 36 INCH BALANCED NEEDLE VALVE

NO 20363 PLATE 23 OF 88
1923





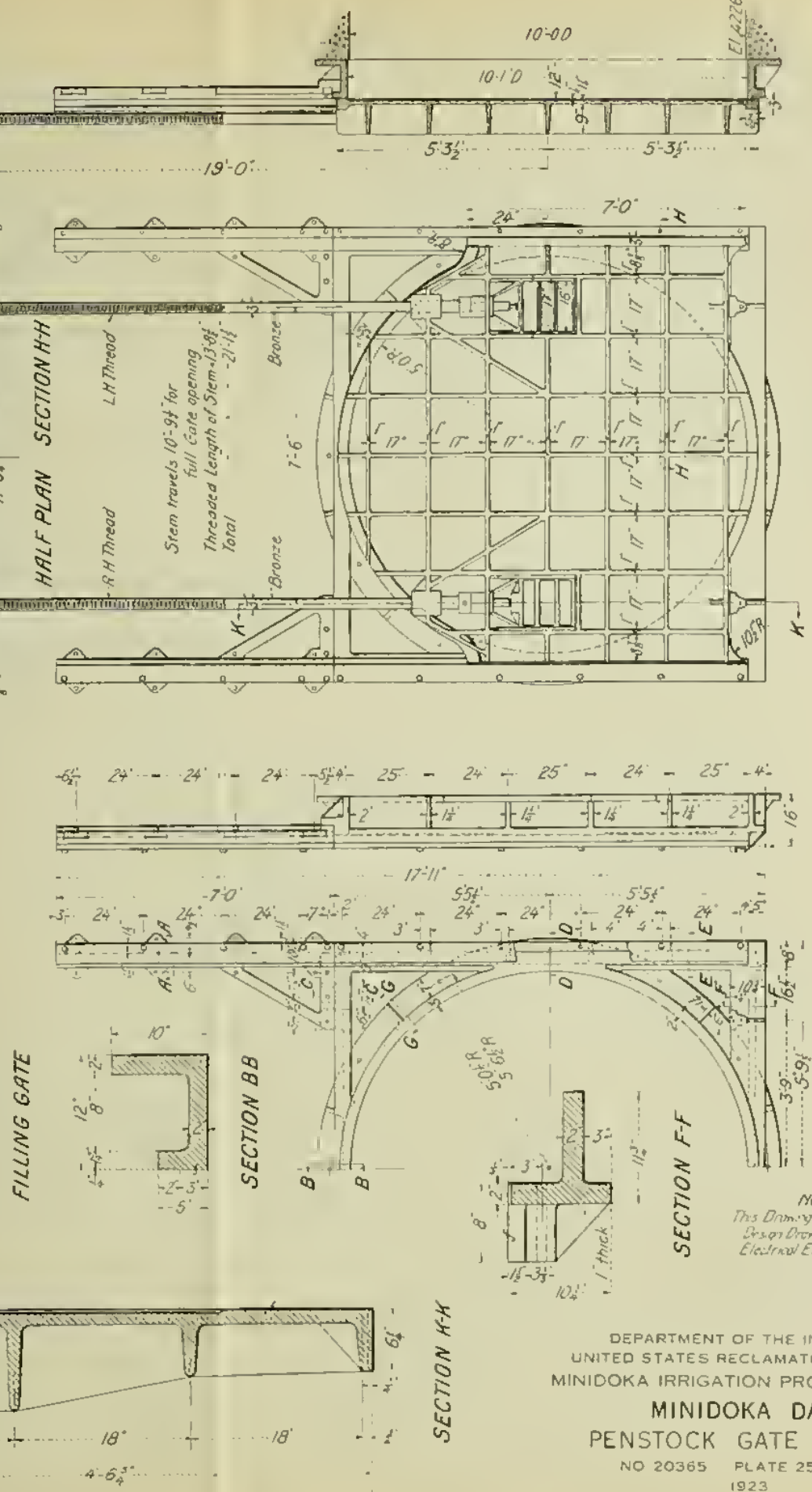


SECTION
FRONT ELEVATION
ASSEMBLY

FRAME DETAILS

NOTE
This Drawing compiled from
Design Drawings made in the
Electrical Engineer's Office.

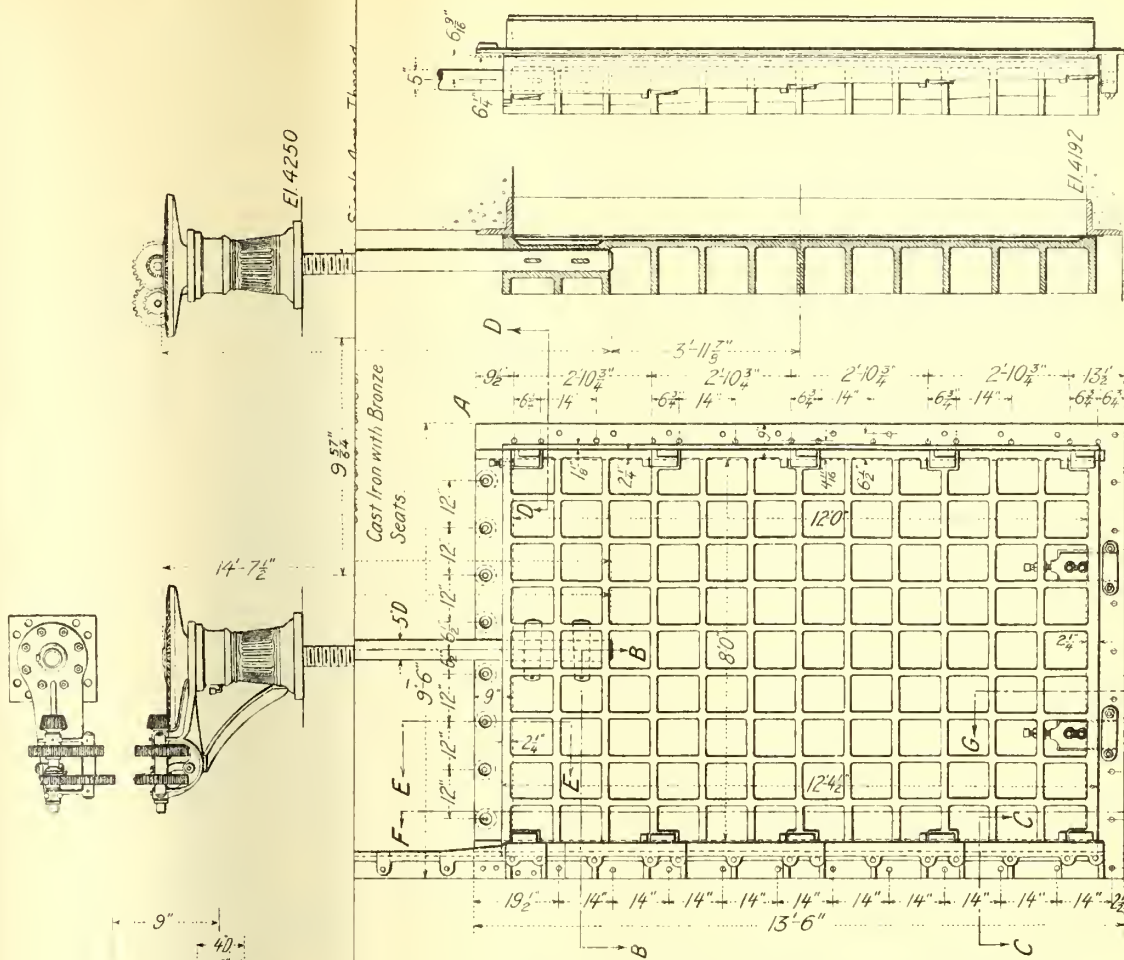
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
MINIDOKA IRRIGATION PROJECT, IDAHO
MINIDOKA DAM
PENSTOCK GATE DETAILS
NO. 20365 PLATE 25 OF 88
1923



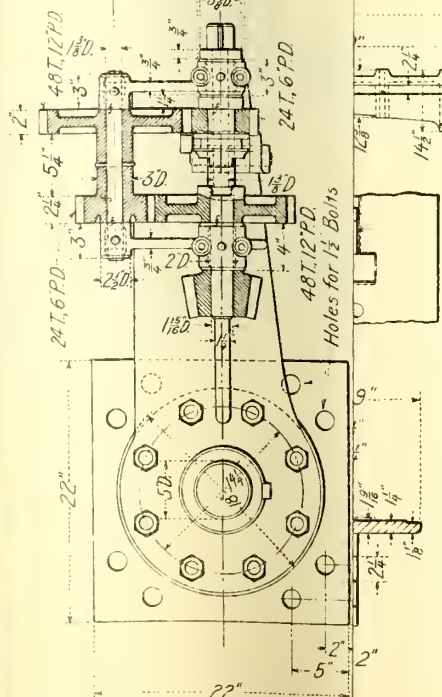
FRONT ELEVATION SECTION
ASSEMBLY

FRAME DETAILS

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
MINIDOKA IRRIGATION PROJECT, IDAHO
MINIDOKA DAM
PENSTOCK GATE DETAILS
NO 20365 PLATE 25 OF 88
1923

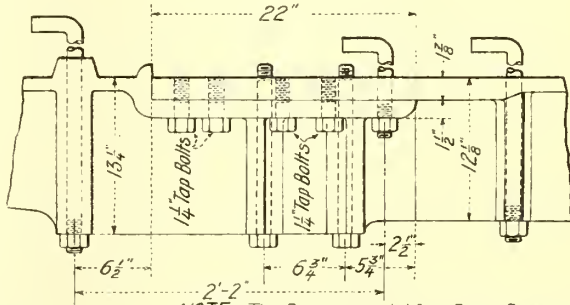


SECTION SIDE ELEVATION
FRONT ELEVATION
ASSEMBLY



BRONZE SEAT
DETAILS

SECTION G-G
Note: Bronze Seat is probably not dove-tailed as shown but held in place by means of Screws

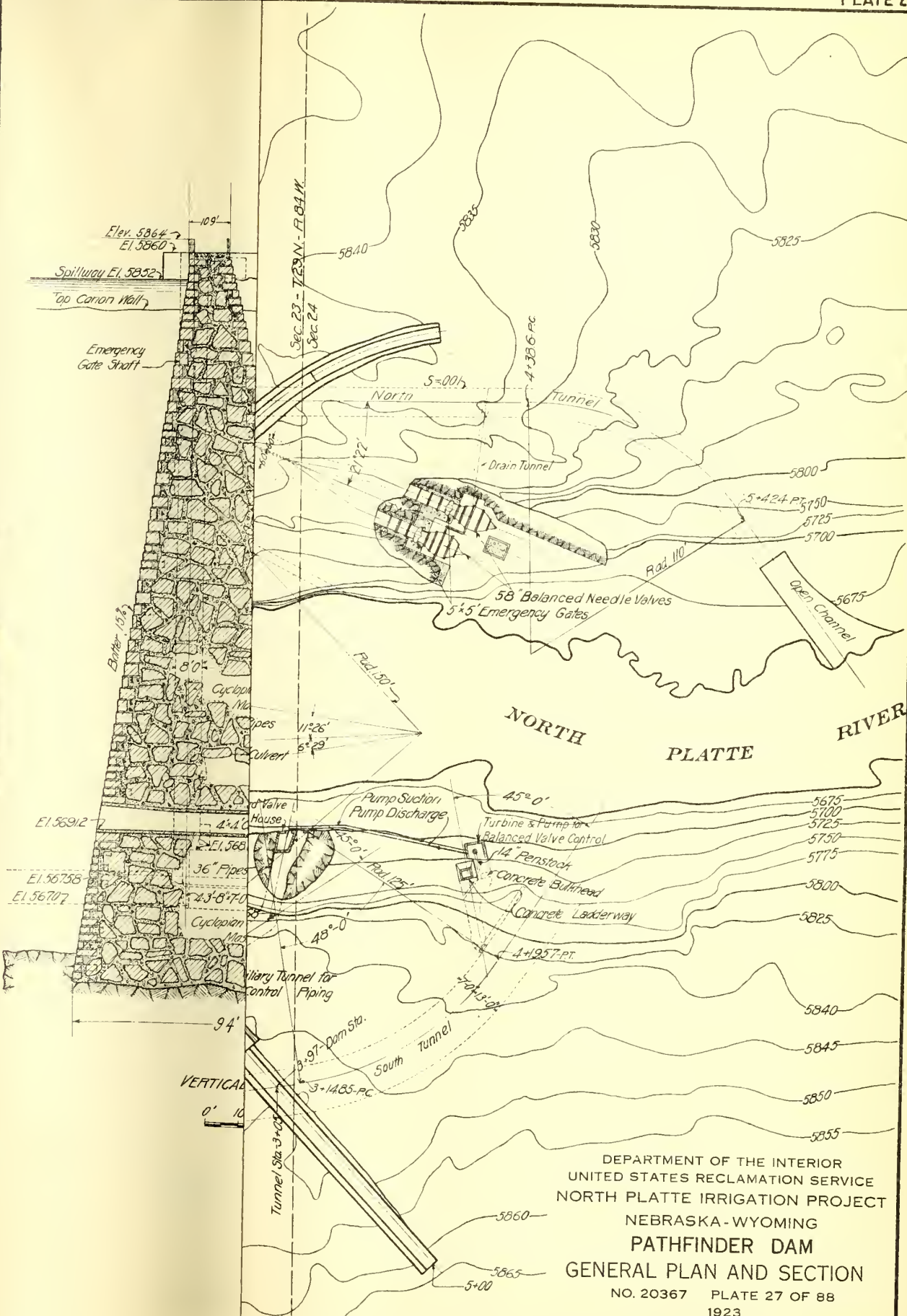


SECTION F-F
(Gate removed)

DETAILS AT H
(Spigot removed)

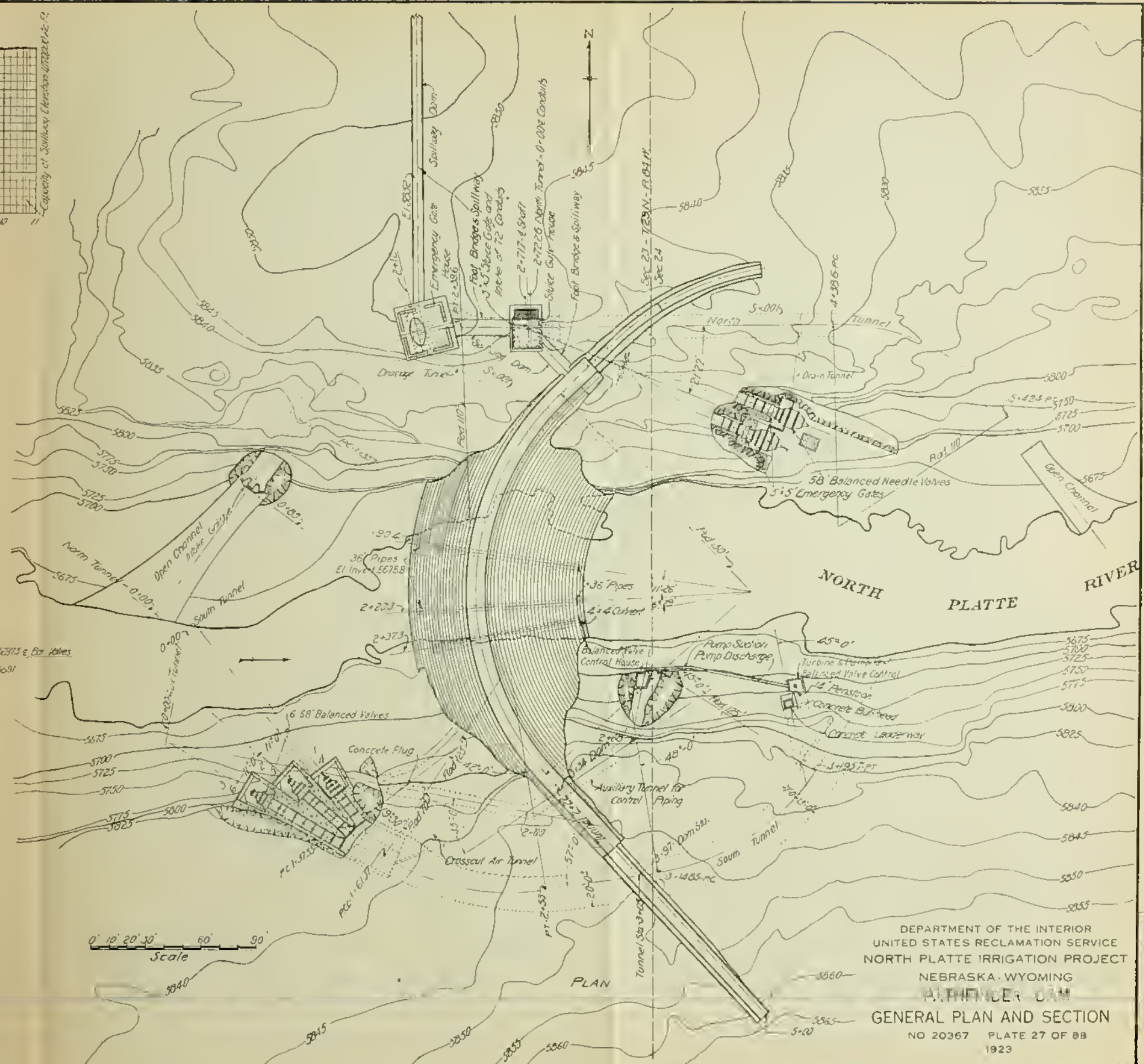
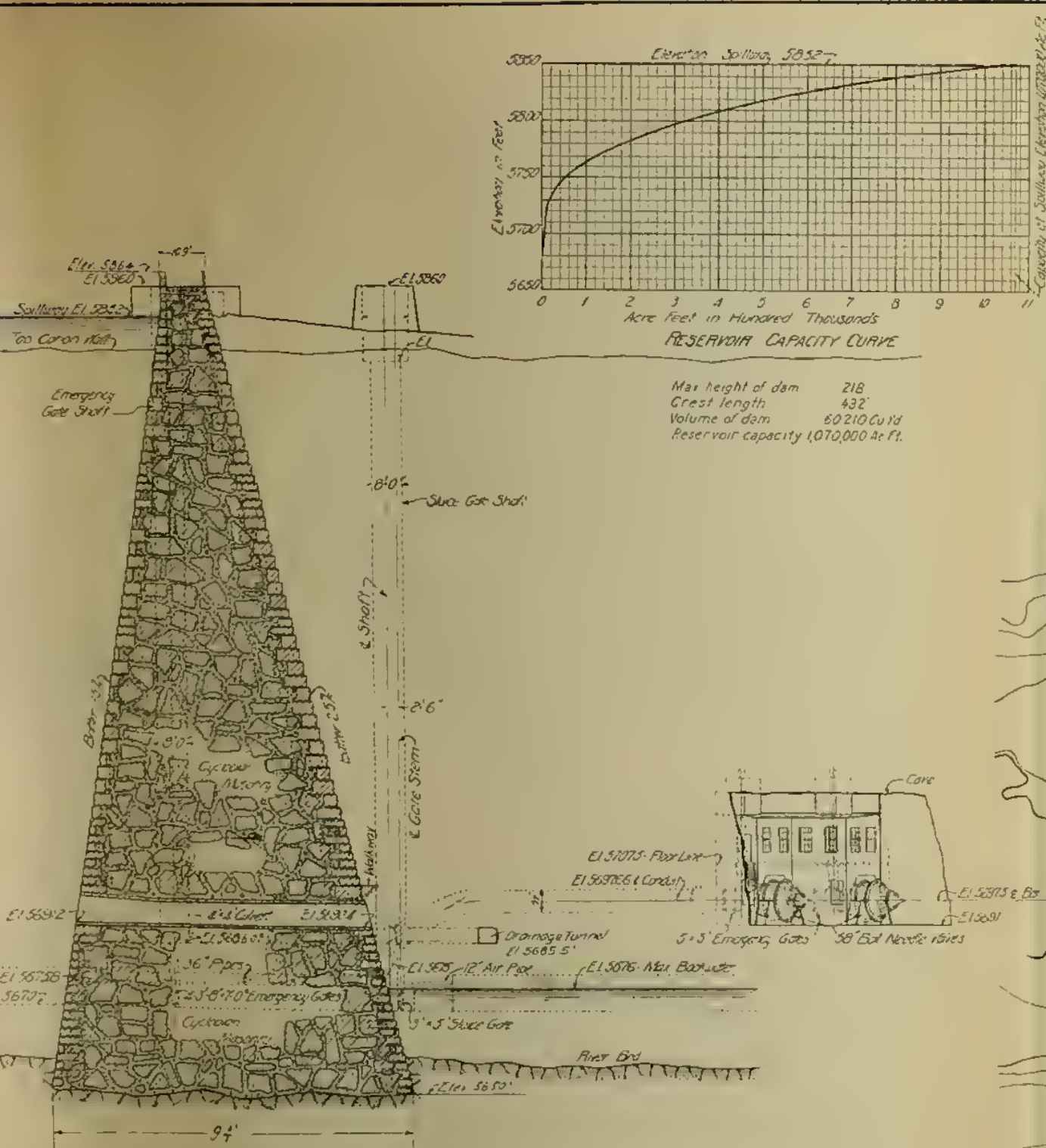
NOTE: This Drawing compiled from Design Drawings made in the Project Office and by the Coffin Valve Company

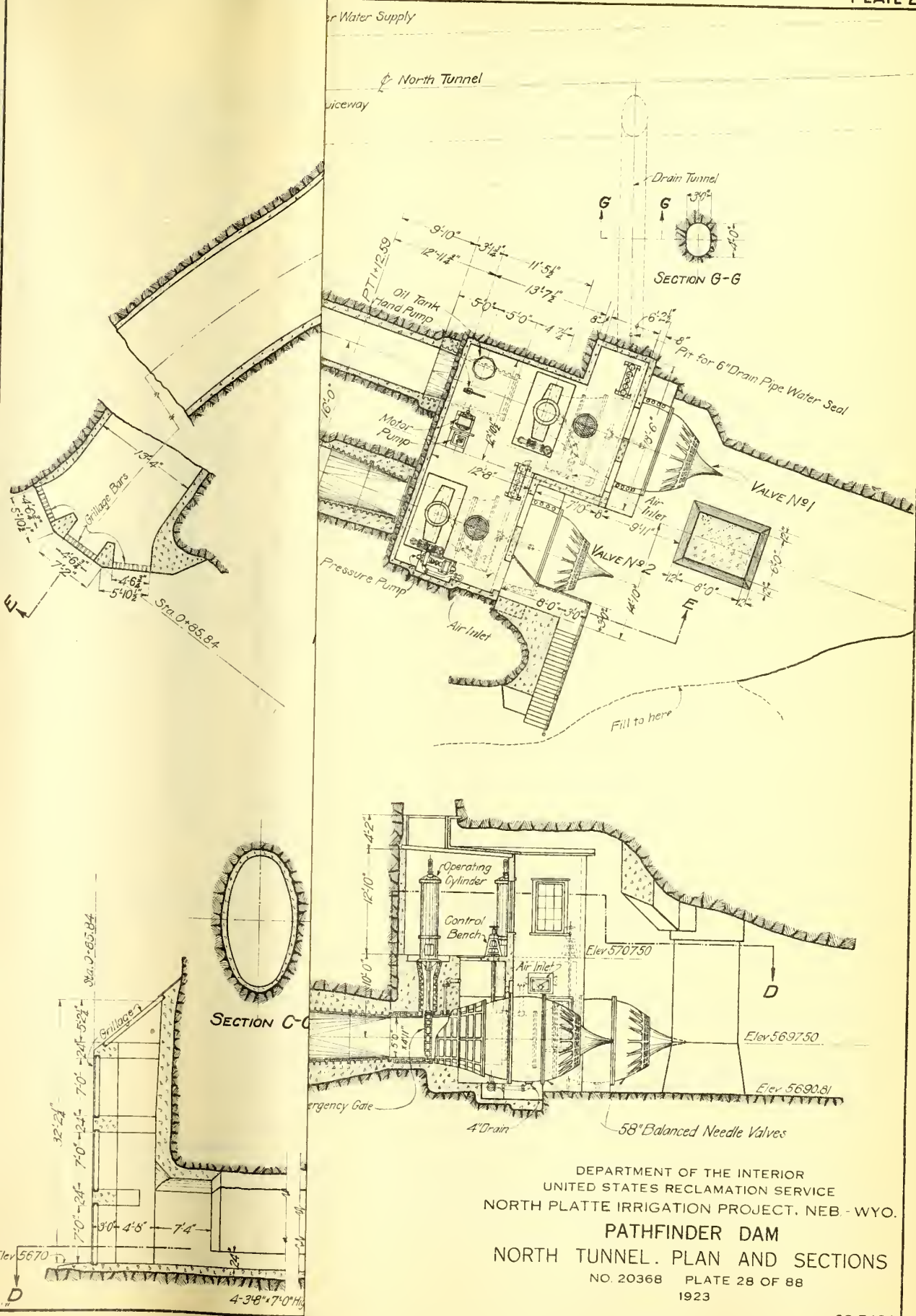
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
MINIDOKA IRRIGATION PROJECT, IDAHO
MINIDOKA DAM
SLIDE GATE DETAILS
NO. 20366 PLATE 26 OF 88
1923

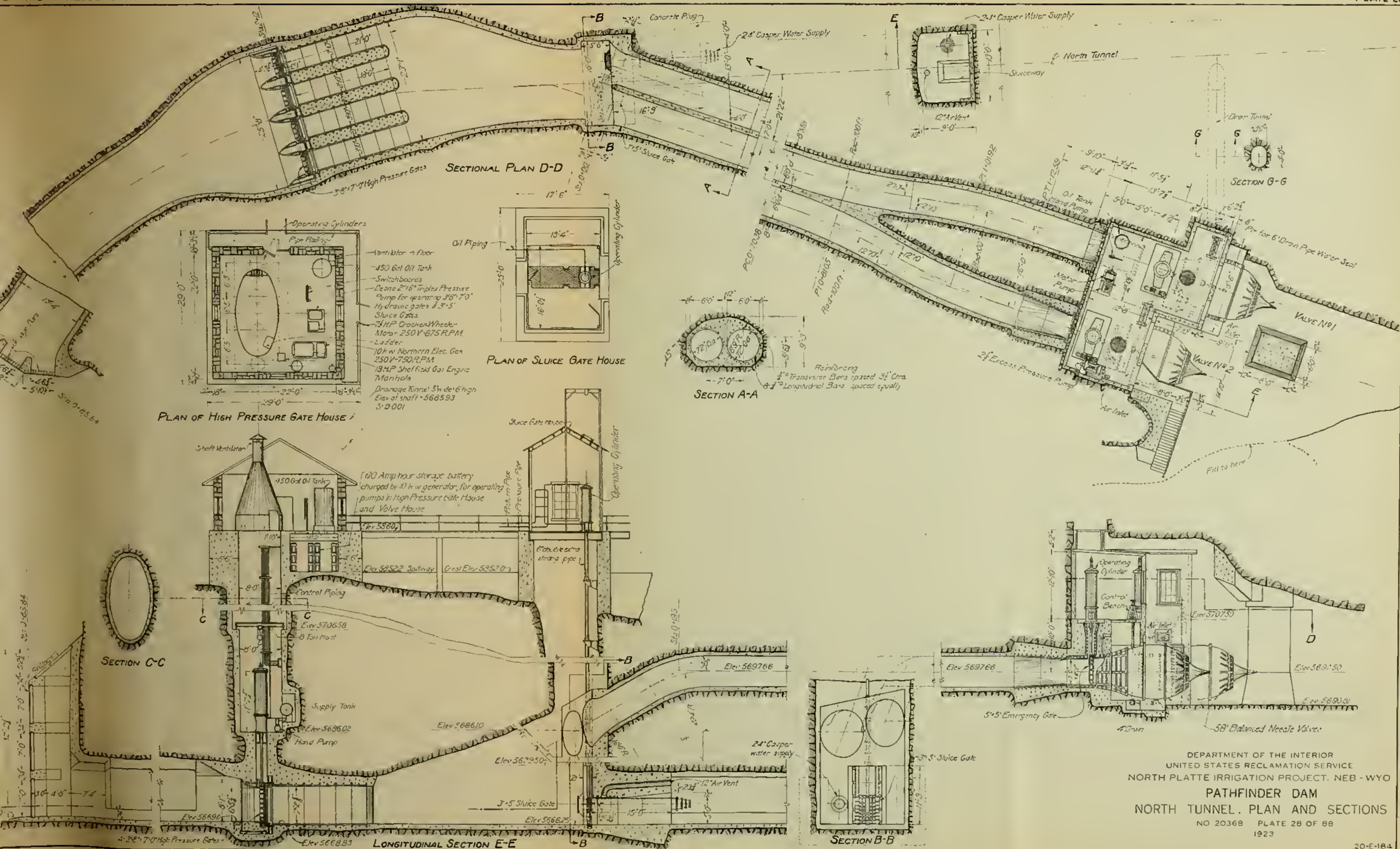


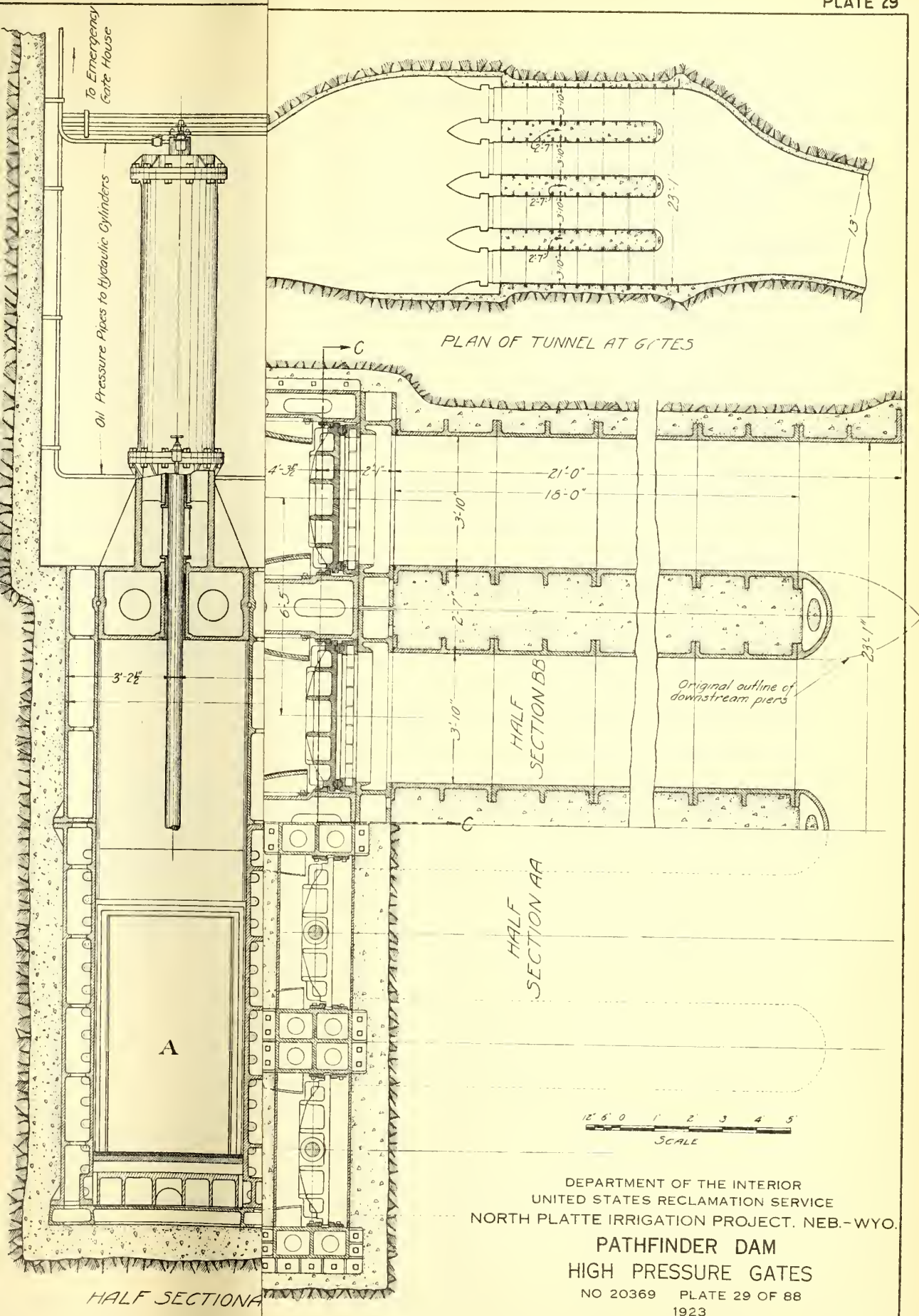
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NORTH PLATTE IRRIGATION PROJECT
NEBRASKA-WYOMING
PATHFINDER DAM
GENERAL PLAN AND SECTION

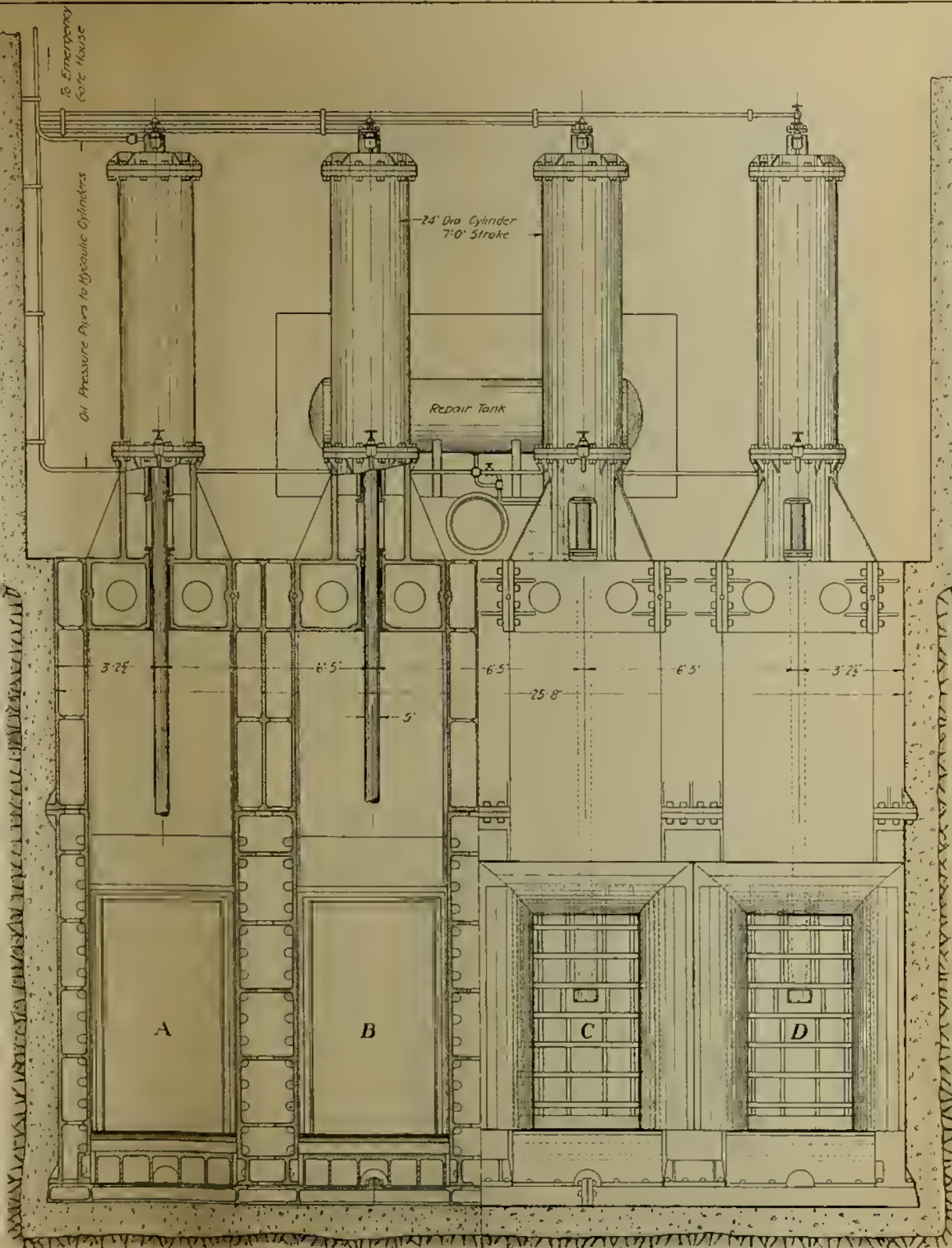
NO. 20367 PLATE 27 OF 88
1923





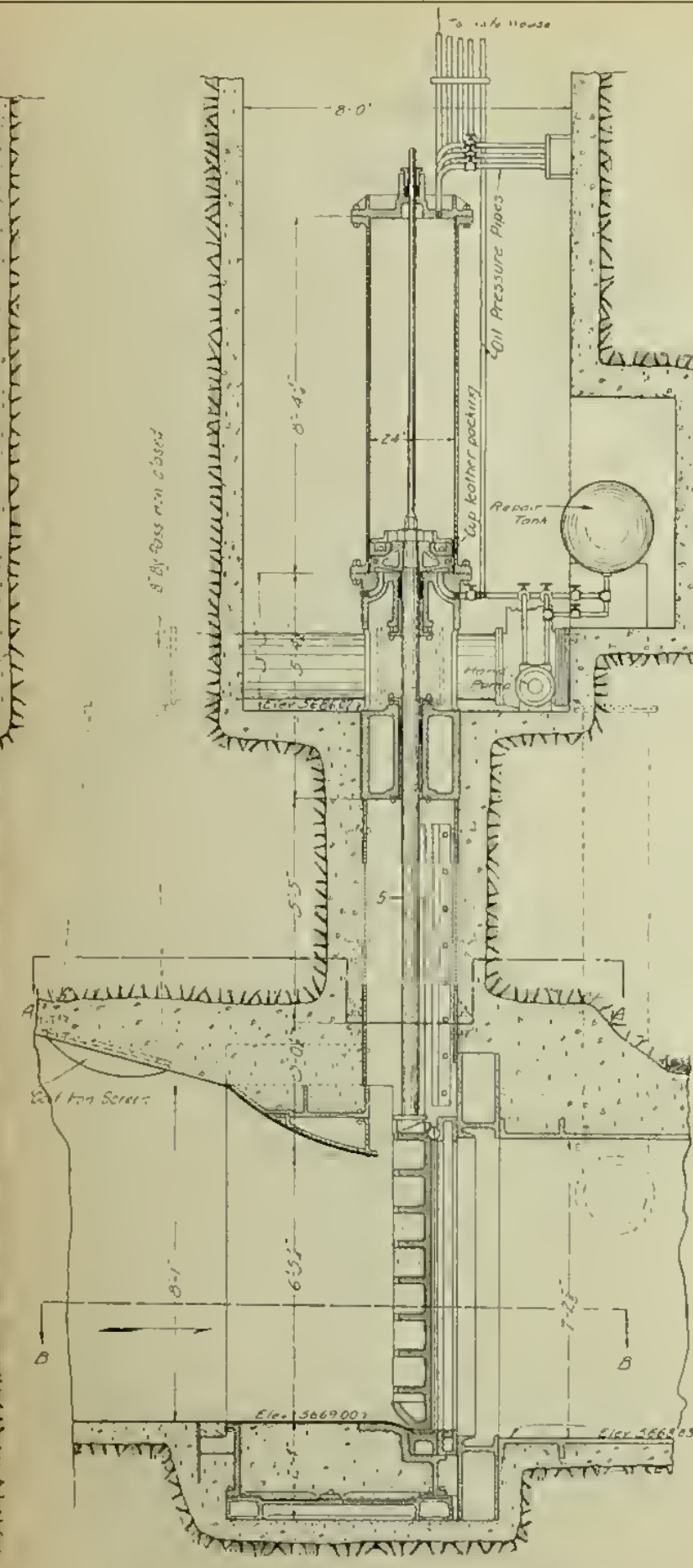




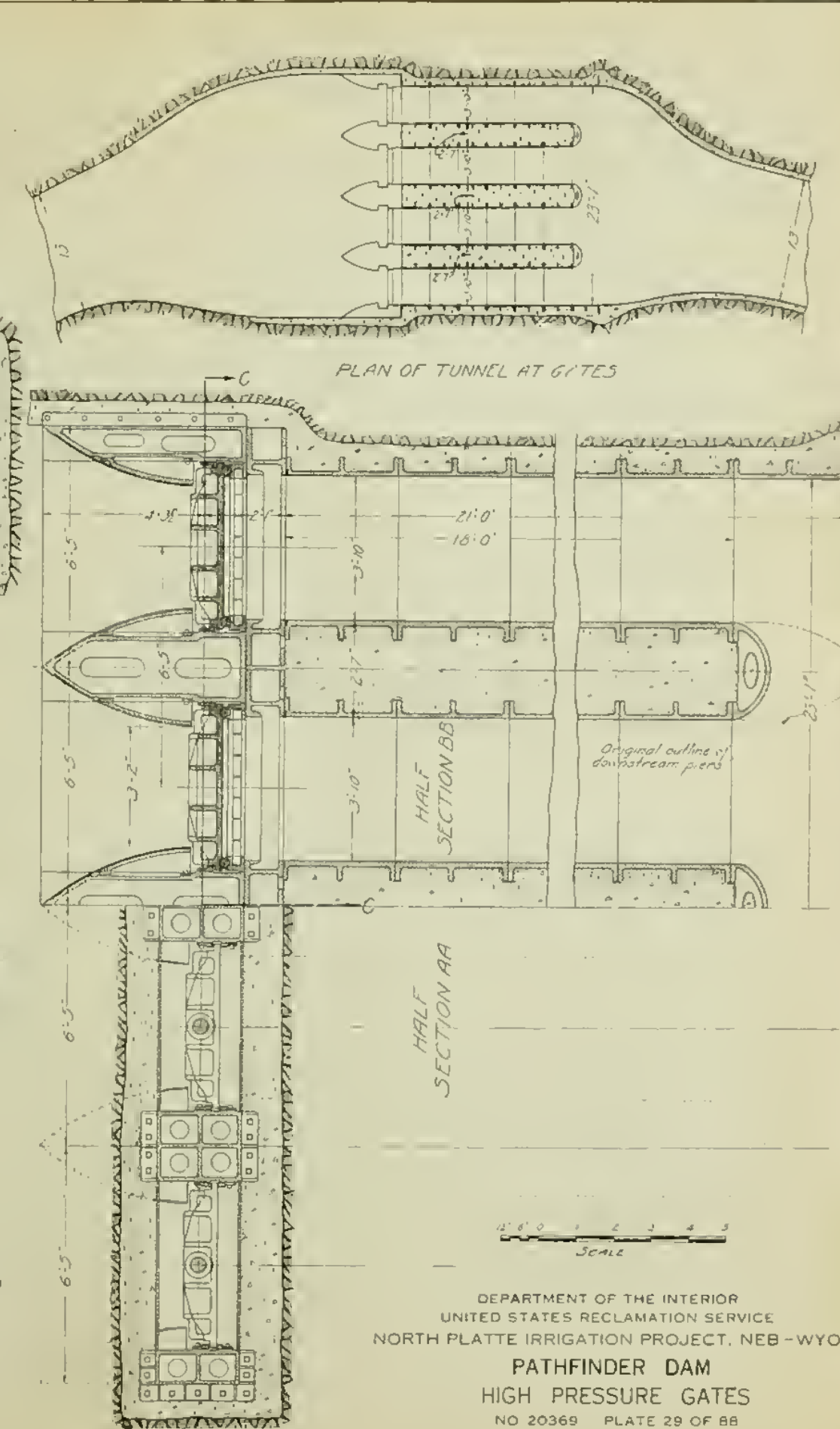


HALF SECTIONAL ELEVATION CC

HALF FRONT ELEVATION



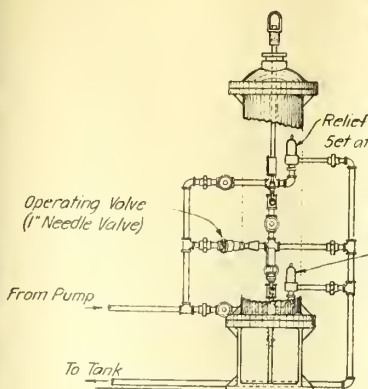
SECTIONAL ELEVATION



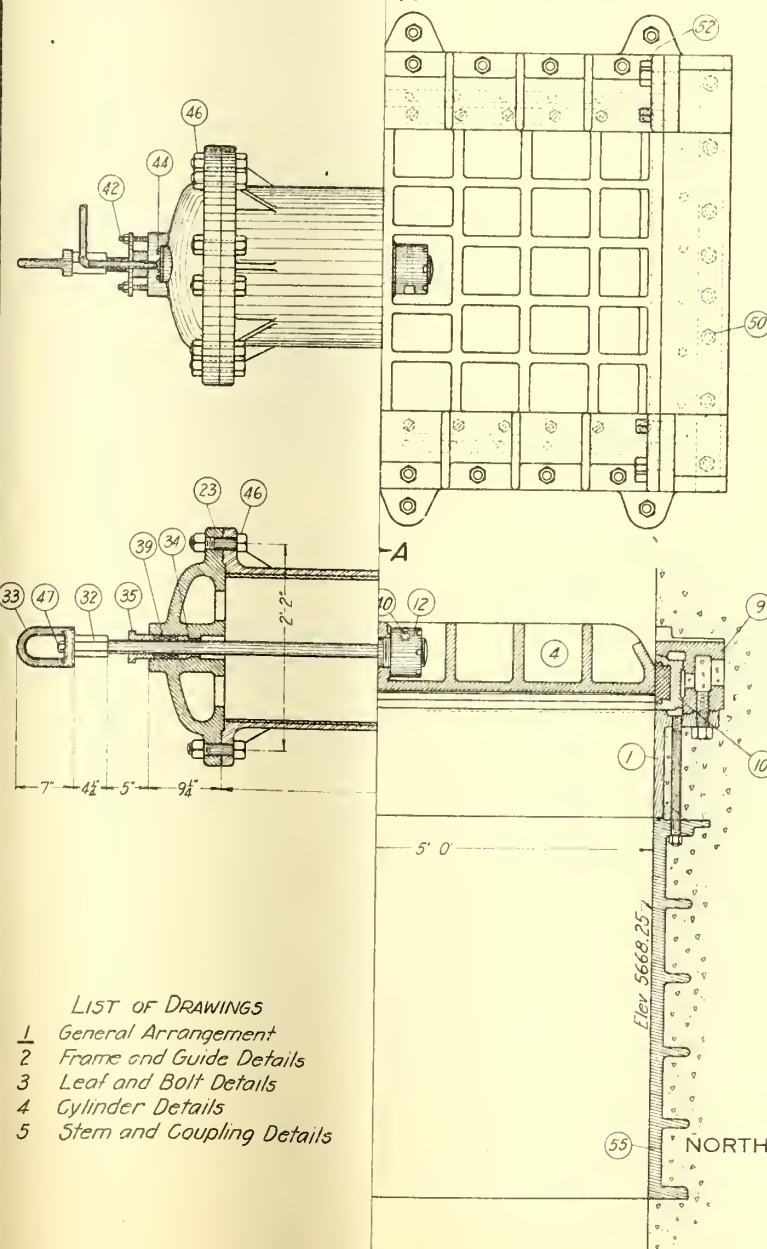
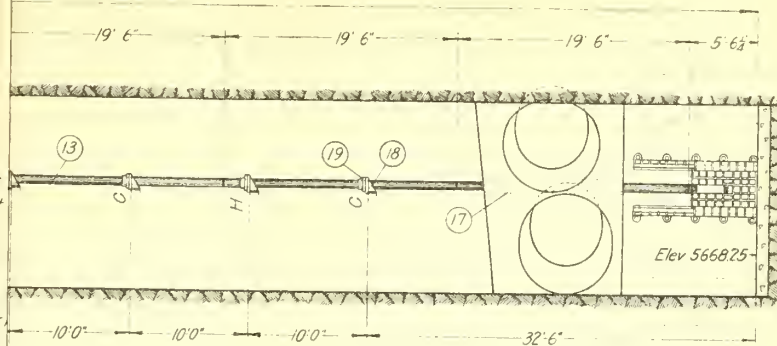
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NORTH PLATTE IRRIGATION PROJECT, NEB-WYO.

PATHFINDER DAM
HIGH PRESSURE GATES

NO 20369 PLATE 29 OF 88
1923



CONTROL PIPING ARRANGEMENT



LIST OF DRAWINGS

- 1 General Arrangement
- 2 Frame and Guide Details
- 3 Leaf and Bolt Details
- 4 Cylinder Details
- 5 Stem and Coupling Details

QTY	MATERIAL	No	DESCRIPTION	DRWG No
1	Semi Steel	1	Gate Frame	20-E-149
2	"	1	Leaf Guide - Left	"
3	"	1	" Right	"
4	"	1	Gate Leaf	20-E-150
5	Glass "C" Bronze	2	Seat Vertical	"
6	"	2	Guide " "	"
7	"	1	" Horizontal	"
8	"	1	Seat	"
9	Semi Steel	1	" Frame	20-E-149
10	"	1	"	"
11	Special Steel	1	Stem	20-E-152
12	Cast Mang Bronze	1	" Lock Nut	"
13	Mild Steel	10	" Extension	"
14	Cast Mang Bronze	9	" Coupling	"
15	"	1	Piston Rod Coupling	"
16	Special Steel	1	" and Sleeve	"
17	Cast Iron	1	Stem Guide	"
18	"	16	" Bracket	"
19	"	16	" Bearing	"
20	Steel	1	Lock Nut Wrench	"
21	Semi Steel	1	Cylinder Base	20-E-151
22	Cast Steel	1	"	"
23	Semi Steel	1	" Head	"
24	Cast Mang Bronze	1	Piston Body	"
25	"	1	" Head	"
26	Glass "C" Bronze	3	Bull Ring	"
27	Cast Mang Bronze	4	Piston Ring	"
28	Gull Bronze	1	4 1/2" Stuffing Box Seat	"
29	"	1	4 1/2" Gland	"
30	Cast Mang Bronze	1	Piston Lock Nut	"
31	Roller " "	1	Indicator Rod	20-E-152
32	Cast Steel	1	Safety Link Nut	"
33	"	1	"	20-E-151
34	Gun Bronze	1	1 1/2" Stuffing Box Seat	"
35	"	1	1 1/2" Gland	"
36	Cast Mang Bronze	1	Stem Eyebolt	20-E-152
37	Sheet Brass	24	Lock Washer	20-E-150
38	4 1/2" Ring Packing	6 in	Garlock No. 99 or equal	20-E-152
39	1 1/2"	3 in	"	"
40	Mild Steel	1	Fillister Head Cap Screw	20-E-150
41	Special Steel	8	Stud 1" x 4"	"
42	Mild Steel	2	" 1/2" x 5"	"
43	"	2	" 3/4" x 6 1/2"	"
44	"	8	" 1/2" x 2"	"
45	Special Steel	4	" 1 1/2" x 5 1/2"	"
46	"	28	Bolt 1 1/2" x 5 1/2"	"
47	Mild Steel	4	" 3/4" x 3 1/2"	"
48	"	64	Rough Machine Bolt 1/2" x 3"	"
49	"	48	" " 1/2" x 2 1/2"	"
50	Special Steel	8	Cap Screw 1 1/2" x 4 1/2"	"
51	"	28	" " 1 1/2" x 3 1/2"	"
52	"	6	" " 1 1/2" x 3 1/2"	"
53	Roller Tobin Bronze	24	Flathead Bolt 3/4" x 3 1/2"	"
54	"	49	" Screw 3/4" x 2 1/2"	"
55	Cast Iron	7	Gate Frame Extension	20-E-201
56	Mild Steel	32	Stud 1 1/2" x 16 1/2"	"
57	"	111	Fuse Wire 226 mils diam	"
58	Mild Steel	12	Stud 1/2" x 3 1/2"	"
59	Cast Iron	1	Air Pipe Flange	"
60	*20 Ga 11.5 Std Sheet Steel	1	Tunnel Plug Air Pipe	20-E-164

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NORTH PLATTE IRRIGATION PROJECT, NEB. WYO.

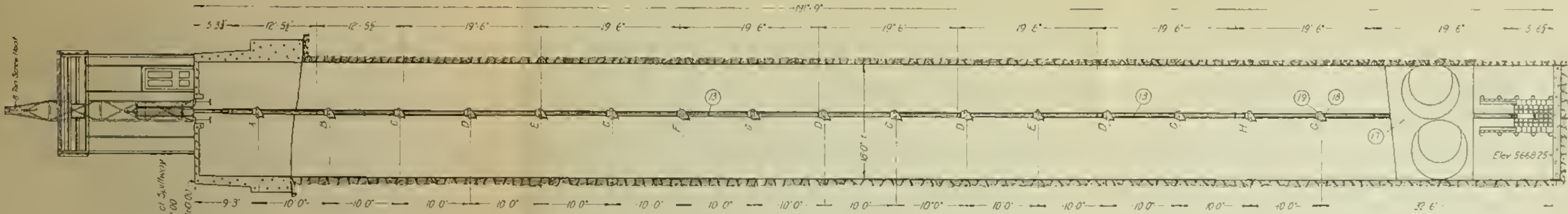
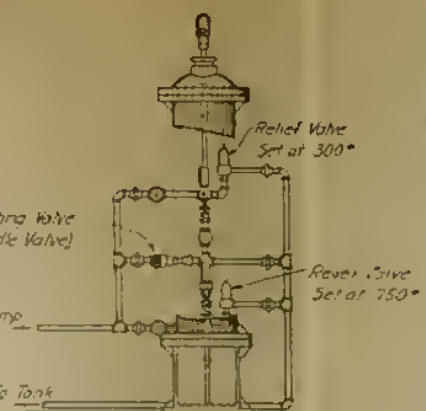
PATHFINDER DAM
SLUICE GATE 5 X 5 FEET

NO. 20370 PLATE 30 OF 88

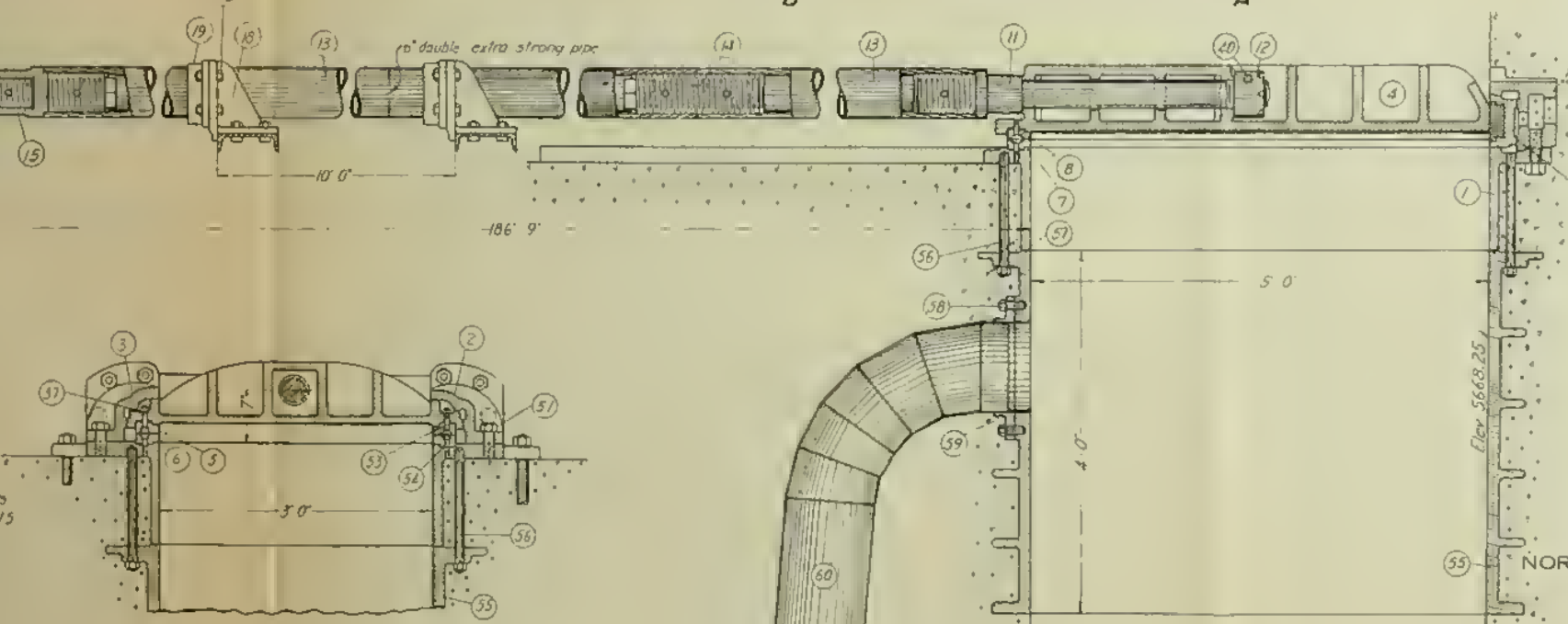
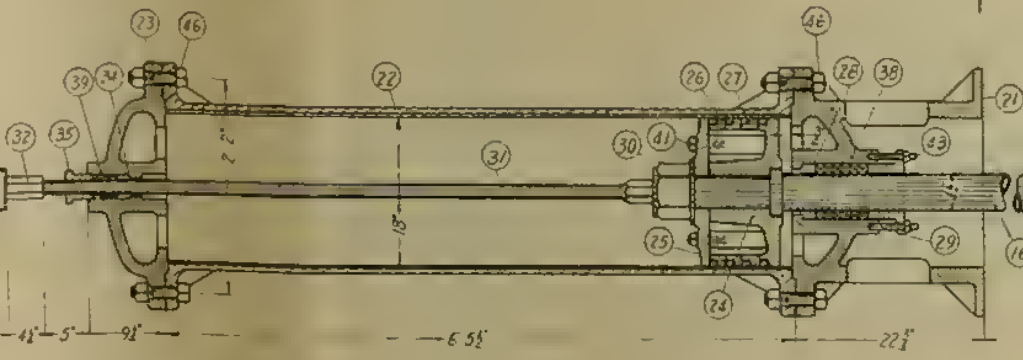
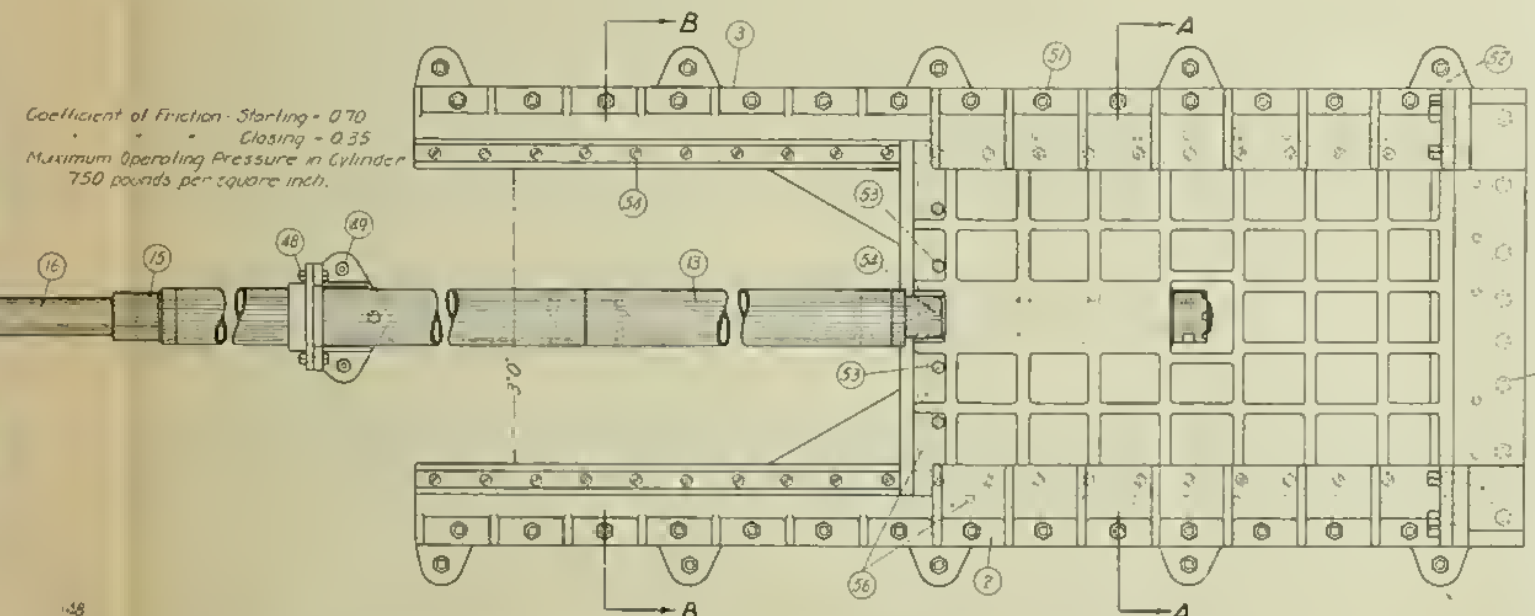
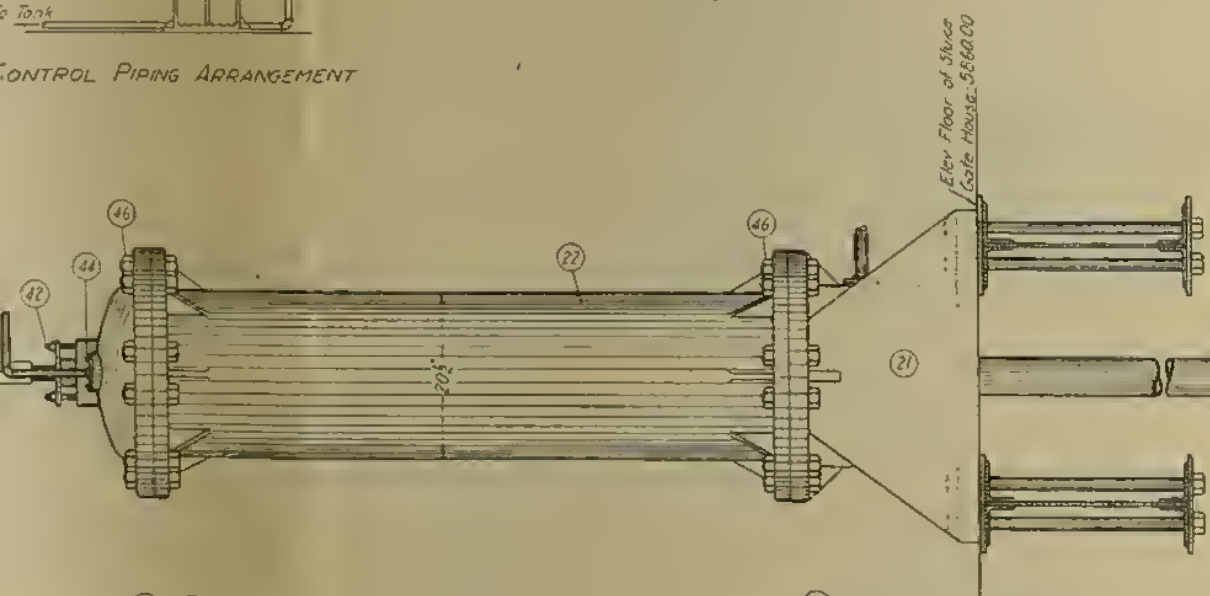
1923

This drawing supersedes Dwg No. 20-E-148

20-E-202



CONTROL PIPING ARRANGEMENT

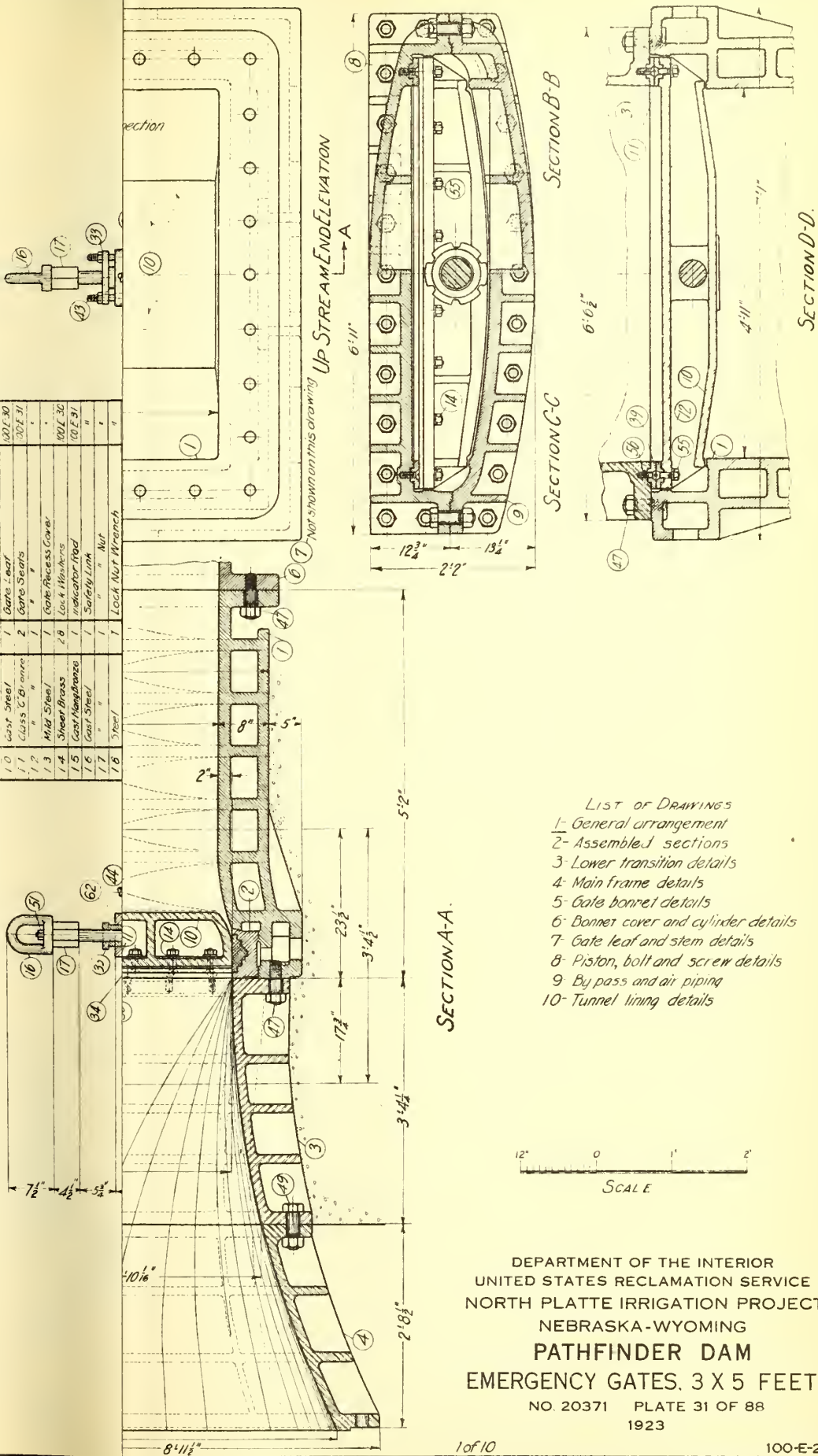


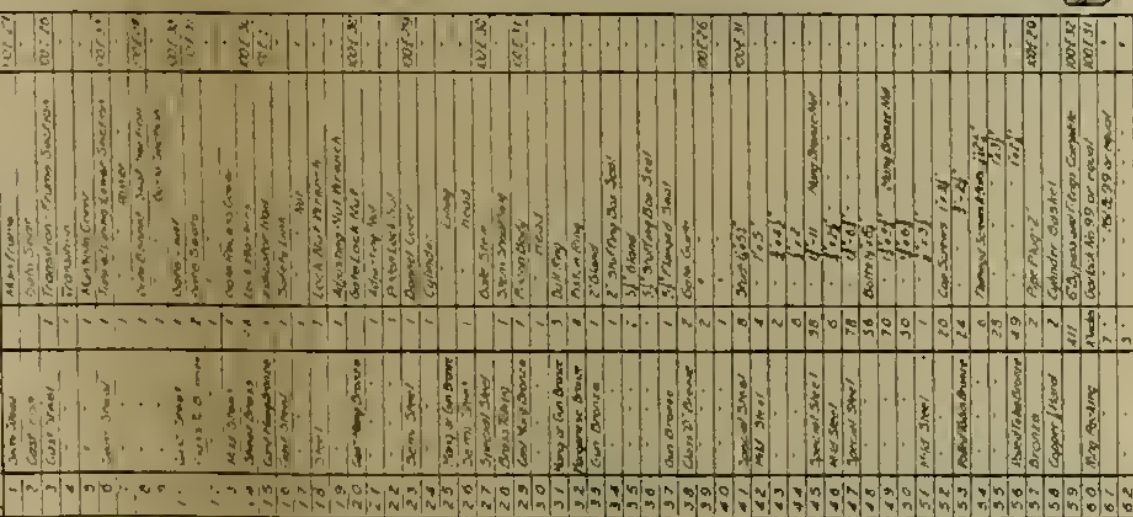
- LIST OF DRAWINGS
General Arrangement
Frame and Guide Details
Leaf and Bolt Details
Cylinder Details
Stem and Coupling Details

5m 60L	MATERIAL	No Qty	DESCRIPTION	DWG NO
1	Semi Steel	1	Gate Frame	20-E-150
2	"	1	Leaf Guide Left	"
3	"	1	" Right	"
4	"	1	Gate Leaf	20-E-150
5	Class C Bronze	2	Seat Vertical	"
6	"	2	Guide	"
7	"	2	Horizontal	"
8	"	1	Seat	"
9	Semi Steel	1	Frame	20-E-149
10	"	1	"	"
11	Special Steel	1	Stem	20-E-150
12	Cast Mang Bronze	1	Lock Nut	"
13	Mild Steel	10	Extension	"
14	Cast Mang Bronze	9	Coupling	"
15	"	1	Piston Rod Coupling	"
16	Special Steel	1	and Sleeve	"
17	Cast Iron	1	Stem Guide	"
18	"	16	Bracket	"
19	"	16	Bearing	"
20	Steel	1	Lock Nut Wrench	"
21	Semi Steel	1	Cylinder Base	20-E-151
22	Cast Steel	1	"	"
23	Semi Steel	1	Head	"
24	Cast Mang Bronze	1	Piston Body	"
25	"	1	Head	"
26	Class C Bronze	3	Bull Ring	"
27	Cast Mang Bronze	4	Piston Ring	"
28	Gun Bronze	1	4" Stiffing Box Seat	"
29	"	1	4" Gland	"
30	Cast Mang Bronze	1	Piston Lock Nut	"
31	Hollow	1	Indicator Rod	20-E-152
32	Cast Steel	1	Safety Link Nut	"
33	"	1	"	20-E-151
34	Gun Bronze	1	1/4" Stiffing Box Seat	"
35	"	1	1/4" Gland	"
36	Cast Mang Bronze	1	Stem Eyebolt	20-E-152
37	Sheet Brass	24	Lock Washer	20-E-150
38	4" Ring Packing	1	in Corick No 99 or equal	20-E-152
39	"	1	"	"
40	Mild Steel	1	Fillister Head Cap Screw	20-E-150
41	Special Steel	8	Stud 1" x 4"	"
42	Mild Steel	2	" 2" x 5"	"
43	"	2	" 2" x 6"	"
44	"	8	" 1/2" x 2"	"
45	Special Steel	4	" 1/2" x 5/8"	"
46	"	28	Bolt 1/2" x 5/8"	"
47	Mild Steel	4	" 3/4" x 3/4"	"
48	"	64	Heavy Hexing Bolt 1/2" x 3/4"	"
49	"	48	" 1/2" x 3/4"	"
50	Special Steel	8	Cap Screw 1/2" x 4"	"
51	"	28	" 1/2" x 3/4"	"
52	"	6	" 1/2" x 3/4"	"
53	Roller Tabin Bronze	24	Flathead Bolt 1/2" x 3/4"	"
54	"	48	Screw 1/2" x 2"	"
55	Cast Iron	1	Gate Frame Extension	20-E-201
56	Mild Steel	32	Stud 1/2" x 1/2"	"
57	"	111	Use wire 22mils diam	"
58	Mild Steel	12	Stud 1/2" x 3/4"	"
59	Cast Iron	1	Air Pipe Flange	"
60	206 (11.534) Steel Steel	1	Tunnel Plug Air Pipe	20-E-164

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NORTH PLATTE IRRIGATION PROJECT, NEB. WYO
PATHFINDER DAM
SLUICE GATE 5 X 5 FEET
NO 20370 PLATE 30 OF 88
1923

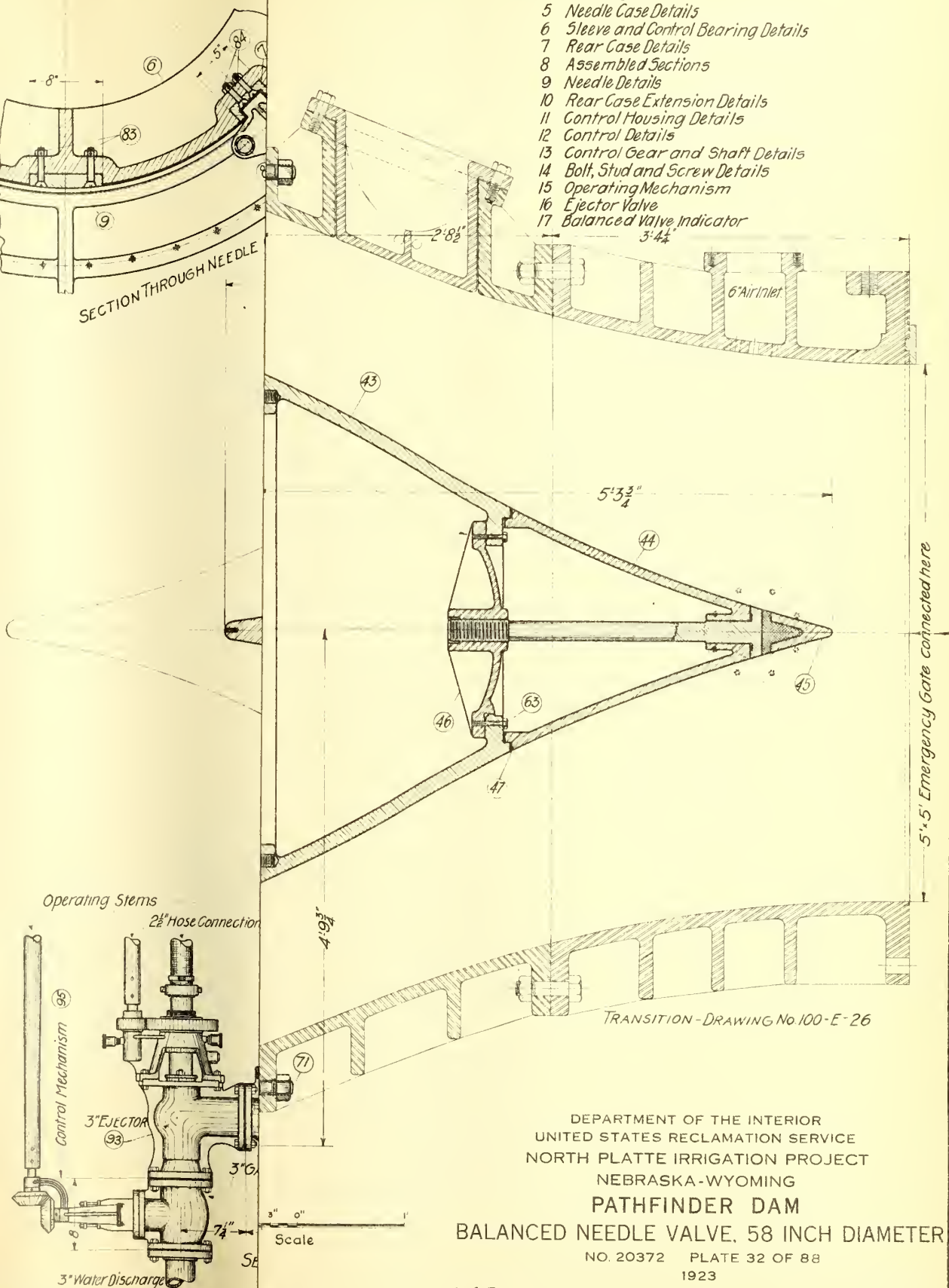
Symbol	Material	Method	Description	Dwg No.
1	Steel	1	Main Frame	1001-27
2	Cast Iron	1	Gate Leaf	1001-28
3	Cast Steel	1	Transition - Frame Section	1001-29
4	"	"	Transition - Gate Section	"
5	"	"	Transition - Lower Section	"
6	Steel	1	Gate Bonnet	1001-30
7	"	1	Gate Leaf	1001-31
8	"	1	Gate Leaf	1001-32
9	"	1	Gate Leaf	1001-33
10	"	1	Gate Leaf	1001-34
11	"	1	Gate Leaf	1001-35
12	"	1	Gate Leaf	1001-36
13	"	1	Gate Leaf	1001-37
14	"	1	Gate Leaf	1001-38
15	"	1	Gate Leaf	1001-39
16	"	1	Gate Leaf	1001-40
17	"	1	Gate Leaf	1001-41
18	"	1	Gate Leaf	1001-42
19	"	1	Gate Leaf	1001-43
20	"	1	Gate Leaf	1001-44
21	"	1	Gate Leaf	1001-45
22	"	1	Gate Leaf	1001-46
23	"	1	Gate Leaf	1001-47
24	"	1	Gate Leaf	1001-48
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26	"	1	Gate Leaf	1001-50
27	"	1	Gate Leaf	1001-51
28	"	1	Gate Leaf	1001-52
29	"	1	Gate Leaf	1001-53
30	"	1	Gate Leaf	1001-54
31	"	1	Gate Leaf	1001-55
32	"	1	Gate Leaf	1001-56
33	"	1	Gate Leaf	1001-57
34	"	1	Gate Leaf	1001-58
35	"	1	Gate Leaf	1001-59
36	"	1	Gate Leaf	1001-60
37	"	1	Gate Leaf	1001-61
38	"	1	Gate Leaf	1001-62
39	"	1	Gate Leaf	1001-63
40	"	1	Gate Leaf	1001-64
41	"	1	Gate Leaf	1001-65
42	"	1	Gate Leaf	1001-66
43	"	1	Gate Leaf	1001-67
44	"	1	Gate Leaf	1001-68
45	"	1	Gate Leaf	1001-69
46	"	1	Gate Leaf	1001-70
47	"	1	Gate Leaf	1001-71
48	"	1	Gate Leaf	1001-72
49	"	1	Gate Leaf	1001-73
50	"	1	Gate Leaf	1001-74
51	"	1	Gate Leaf	1001-75
52	"	1	Gate Leaf	1001-76
53	"	1	Gate Leaf	1001-77
54	"	1	Gate Leaf	1001-78
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56	"	1	Gate Leaf	1001-80
57	"	1	Gate Leaf	1001-81
58	"	1	Gate Leaf	1001-82
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73	"	1	Gate Leaf	1001-97
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75	"	1	Gate Leaf	1001-99
76	"	1	Gate Leaf	1001-100





LIST OF DRAWINGS:

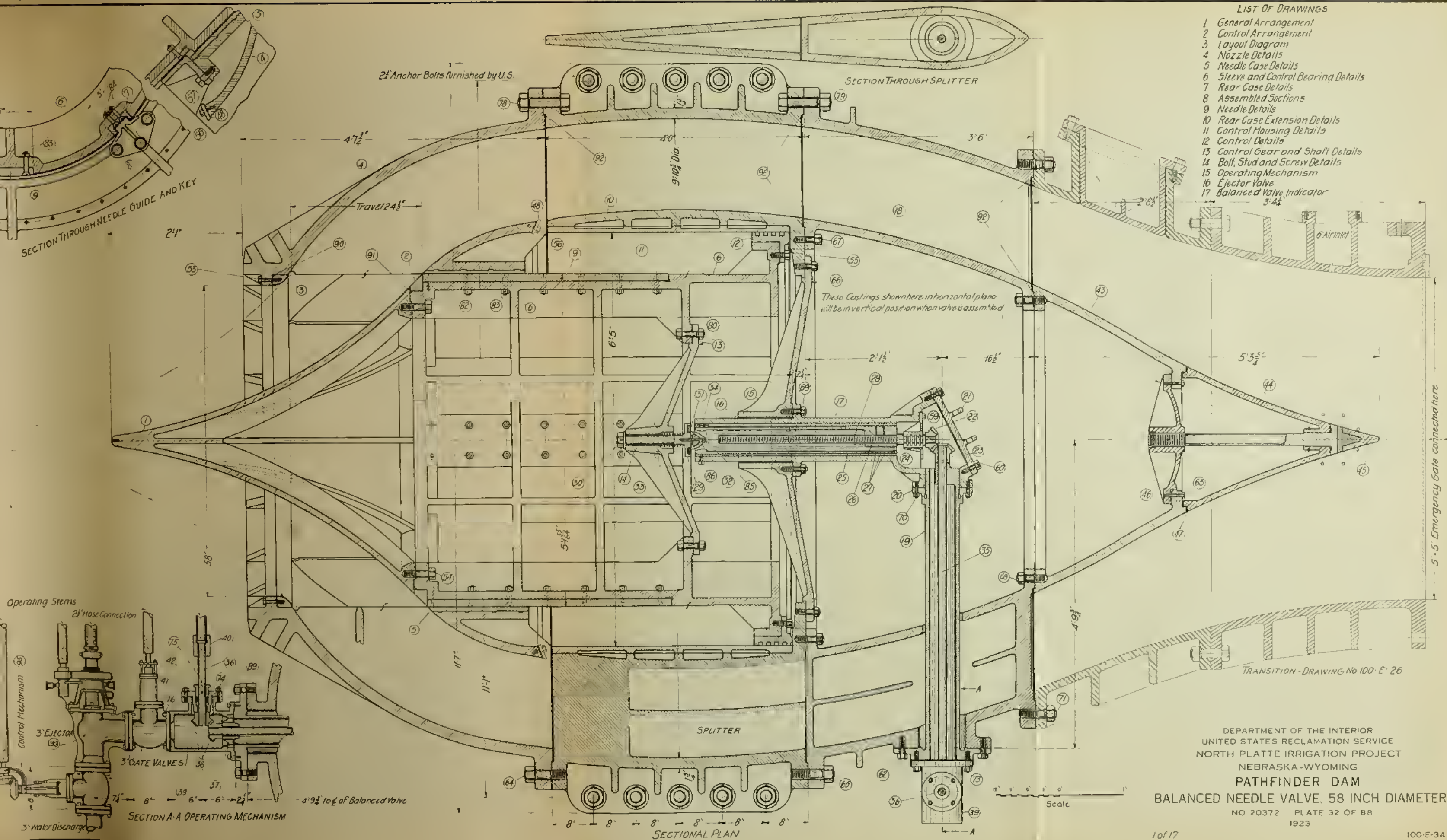
- 1 General Arrangement
- 2 Control Arrangement
- 3 Layout Diagram
- 4 Nozzle Details
- 5 Needle Case Details
- 6 Sleeve and Control Bearing Details
- 7 Rear Case Details
- 8 Assembled Sections
- 9 Needle Details
- 10 Rear Case Extension Details
- 11 Control Housing Details
- 12 Control Details
- 13 Control Gear and Shaft Details
- 14 Bolt, Stud and Screw Details
- 15 Operating Mechanism
- 16 Ejector Valve
- 17 Balanced Valve Indicator



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NORTH PLATTE IRRIGATION PROJECT
NEBRASKA-WYOMING

PATHFINDER DAM BALANCED NEEDLE VALVE, 58 INCH DIAMETER

NO. 20372 PLATE 32 OF 88
1923

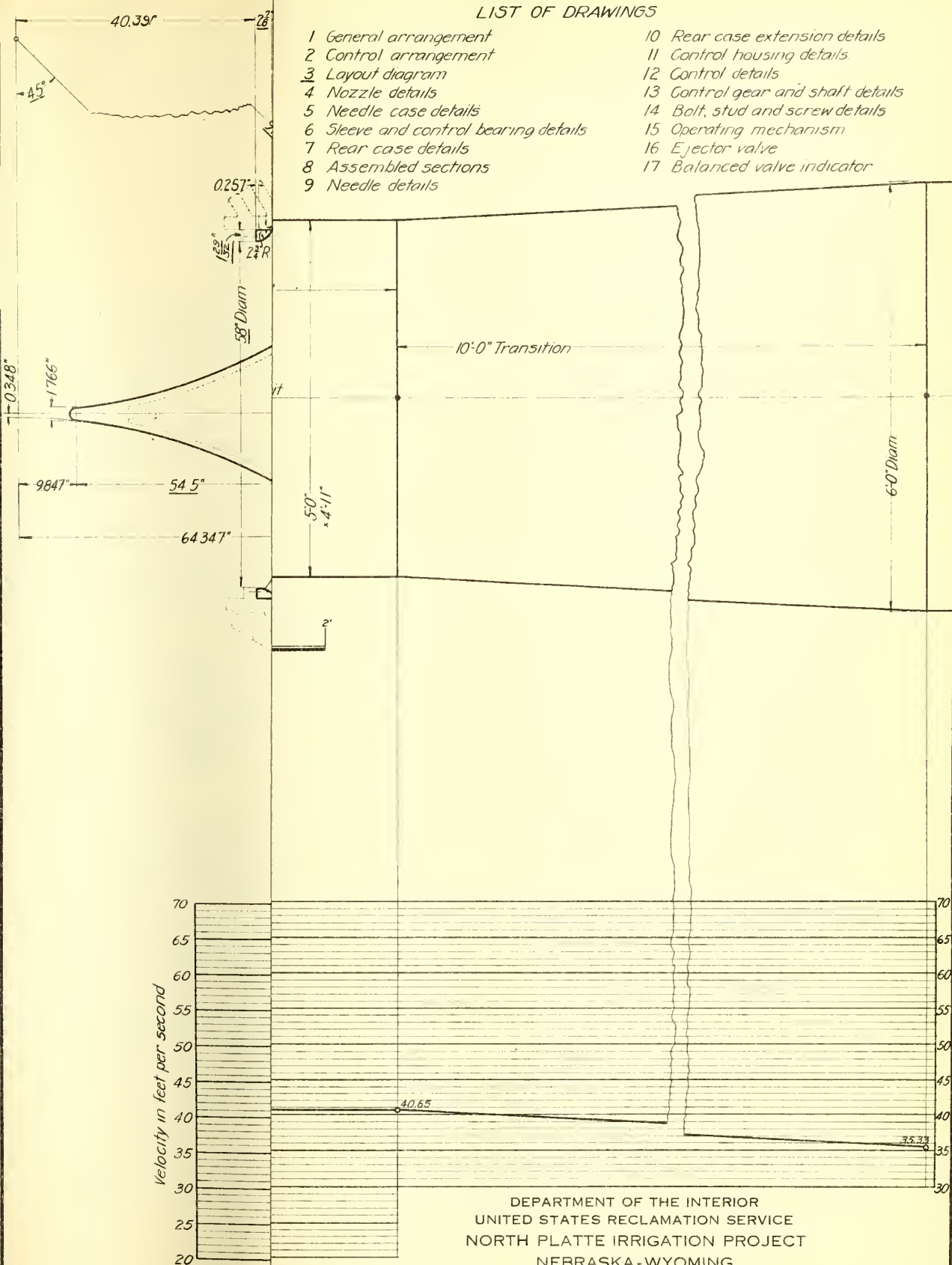


LIST OF DRAWINGS

- 1 General Arrangement
- 2 Control Arrangement
- 3 Layout Diagram
- 4 Nozzle Details
- 5 Needle Case Details
- 6 Sleeve and Control Bearing Details
- 7 Rear Case Details
- 8 Assembled Sections
- 9 Needle Details
- 10 Rear Case Extension Details
- 11 Control Housing Details
- 12 Control Details
- 13 Control Gear and Shaft Details
- 14 Bolt, Stud and Screw Details
- 15 Operating Mechanism
- 16 Ejector Valve
- 17 Balanced Valve Indicator

LIST OF DRAWINGS

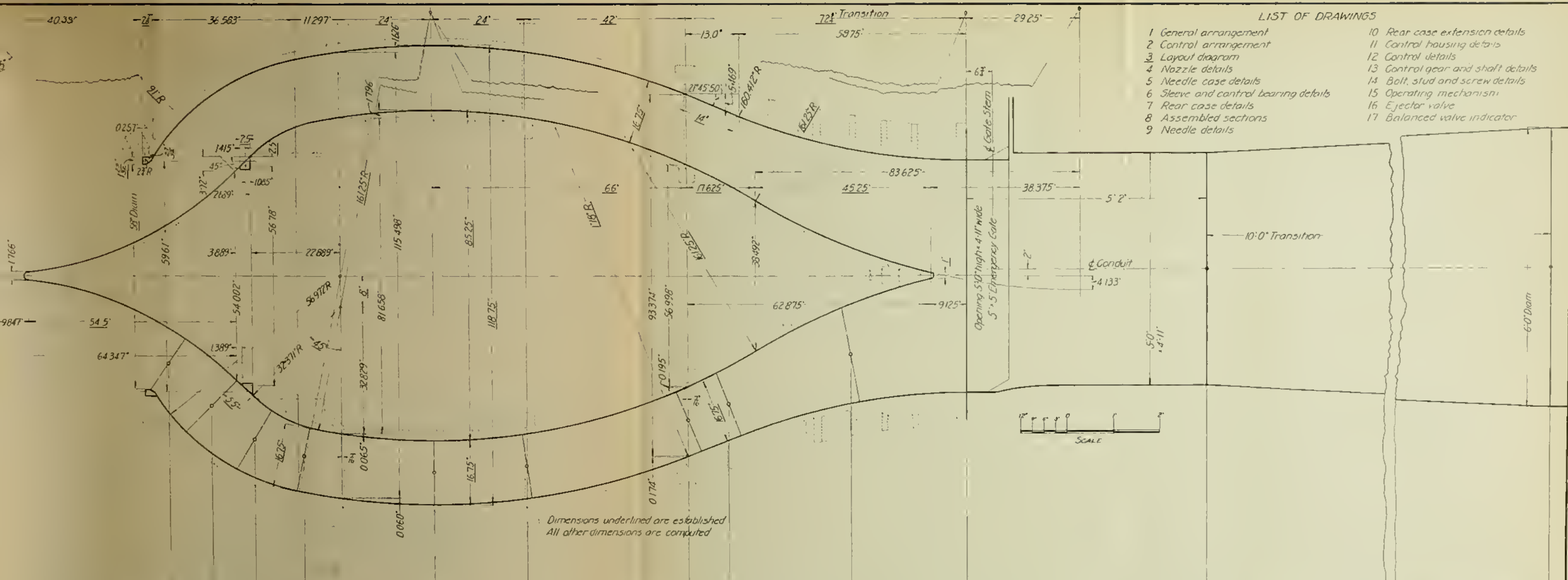
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|--------------------------------------|-----------------------------------|
| 1 General arrangement | 10 Rear case extension details |
| 2 Control arrangement | 11 Control housing details |
| 3 Layout diagram | 12 Control details |
| 4 Nozzle details | 13 Control gear and shaft details |
| 5 Needle case details | 14 Bolt, stud and screw details |
| 6 Sleeve and control bearing details | 15 Operating mechanism |
| 7 Rear case details | 16 Ejector valve |
| 8 Assembled sections | 17 Balanced valve indicator |
| 9 Needle details | |



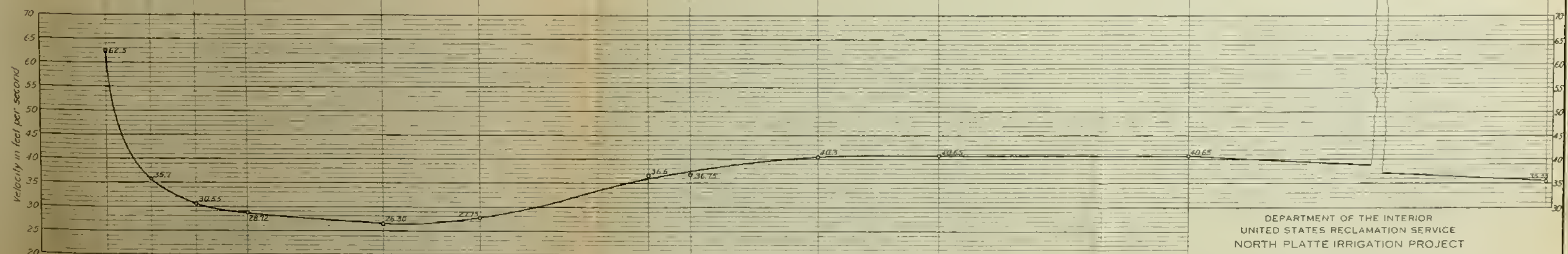
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NORTH PLATTE IRRIGATION PROJECT
NEBRASKA-WYOMING
PATHFINDER DAM

LAYOUT DIAGRAM FOR 58 INCH BALANCED NEEDLE VALVE

NO. 20373 PLATE 33 OF 88
1923

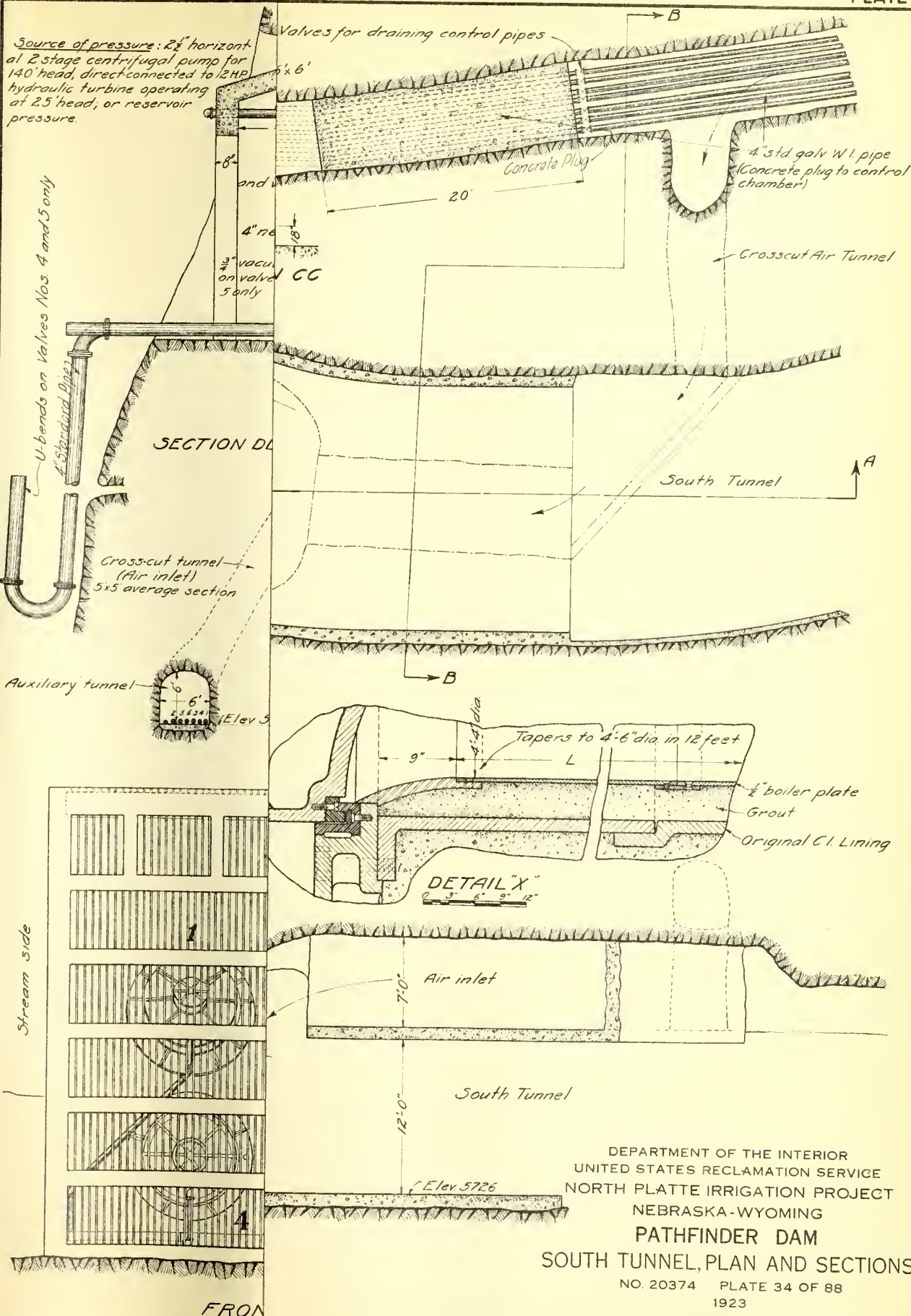


- LIST OF DRAWINGS
- | | |
|--------------------------------------|-----------------------------------|
| 1 General arrangement | 10 Rear case extension details |
| 2 Control arrangement | 11 Control housing details |
| 3 Layout diagram | 12 Control details |
| 4 Nozzle details | 13 Control gear and shaft details |
| 5 Needle case details | 14 Bolt, stud and screw details |
| 6 Sleeve and control bearing details | 15 Operating mechanism |
| 7 Rear case details | 16 Ejector valve |
| 8 Assembled sections | 17 Balanced valve indicator |
| 9 Needle details | |



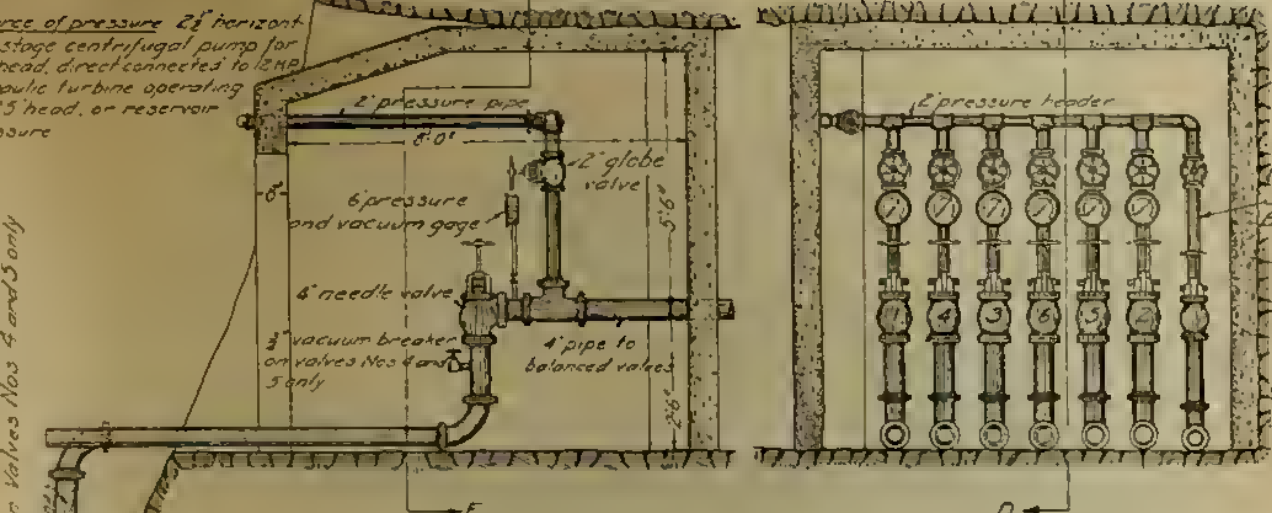
Velocity based on maximum capacity of 1000 cubic feet per second

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NORTH PLATTE IRRIGATION PROJECT
NEBRASKA-WYOMING
PATHFINDER DAM
LAYOUT DIAGRAM FOR 58 INCH BALANCED NEEDLE VALVE
NO 20373 PLATE 33 OF 88
1923



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NORTH PLATTE IRRIGATION PROJECT
NEBRASKA-WYOMING
PATHFINDER DAM
SOUTH TUNNEL, PLAN AND SECTIONS
NO. 20374 PLATE 34 OF 88
1923

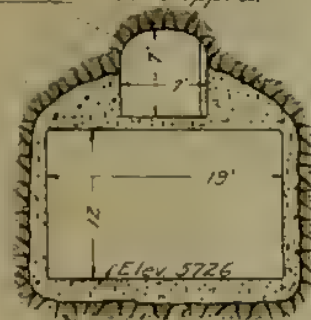
U-bends on Valves Nos 4 and 5 only



CONTROL CHAMBER

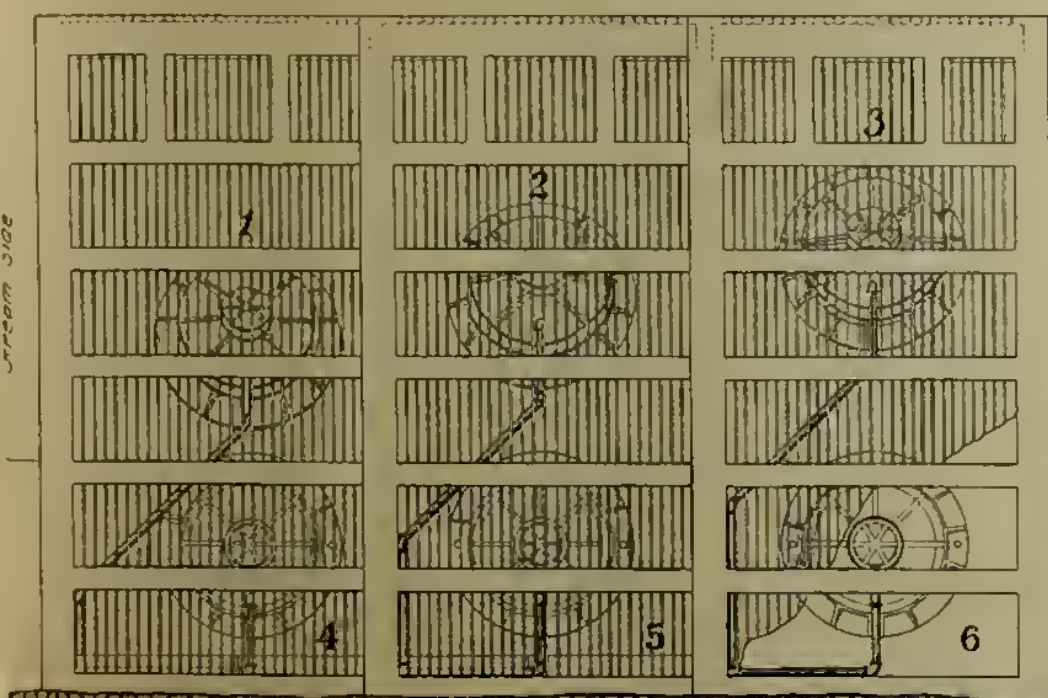
SECTION EE

Elev 5749 approx

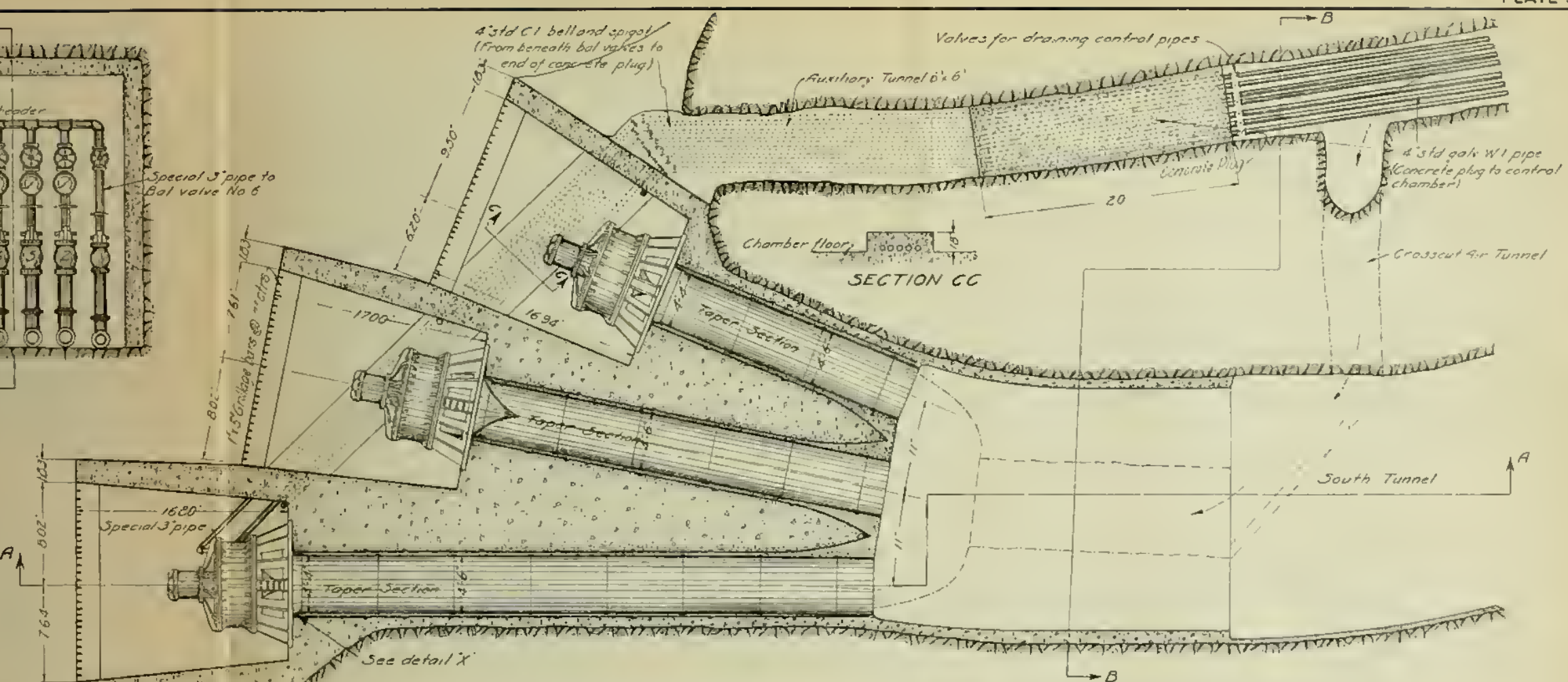


SECTION BB

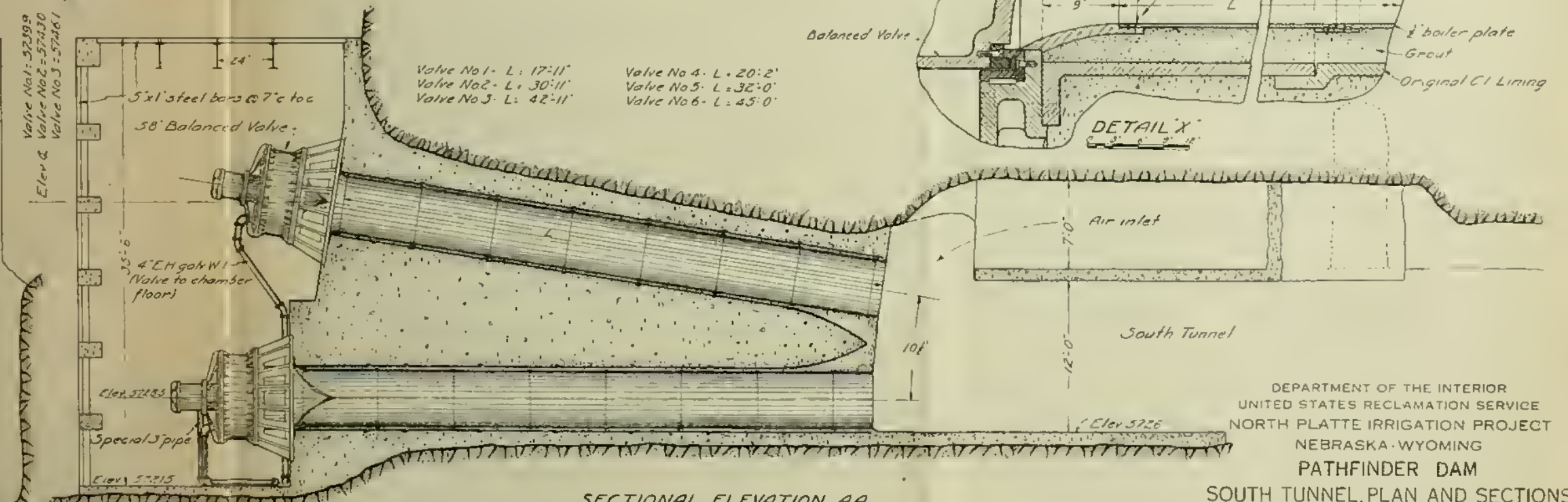
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FRONT ELEVATION (DEVELOPED)

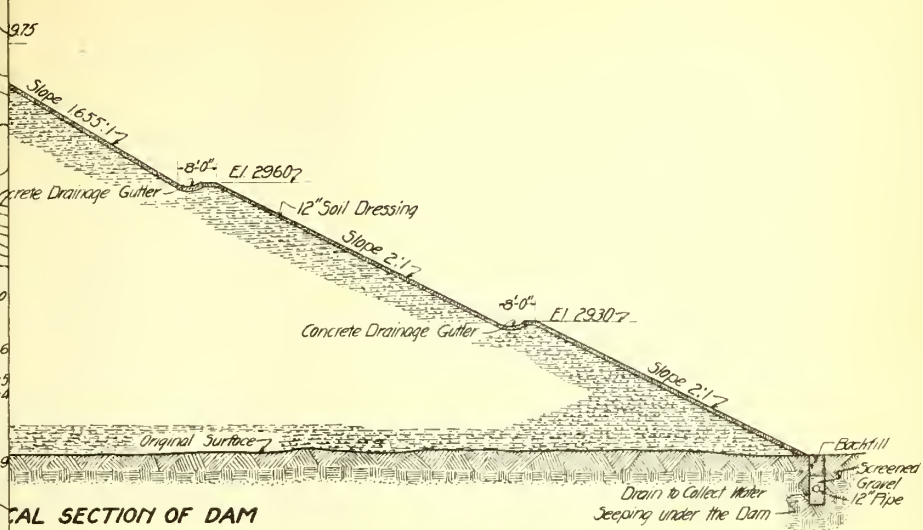


SECTIONAL PLAN through lower tier of balanced valves

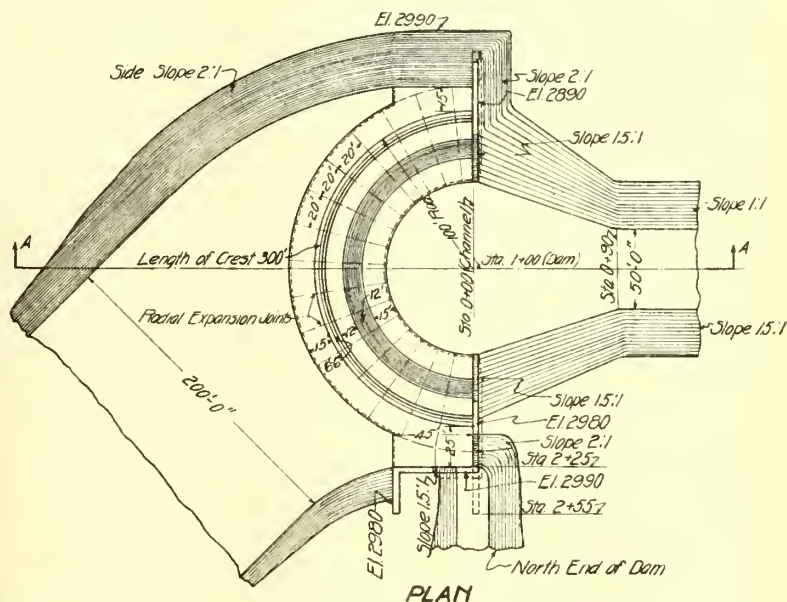


SECTIONAL ELEVATION AA

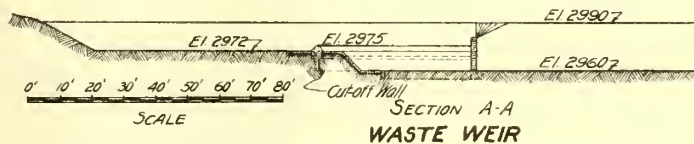
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NORTH PLATTE IRRIGATION PROJECT
NEBRASKA-WYOMING
PATHFINDER DAM
SOUTH TUNNEL, PLAN AND SECTIONS
NO 20374 PLATE 34 OF 88
1923



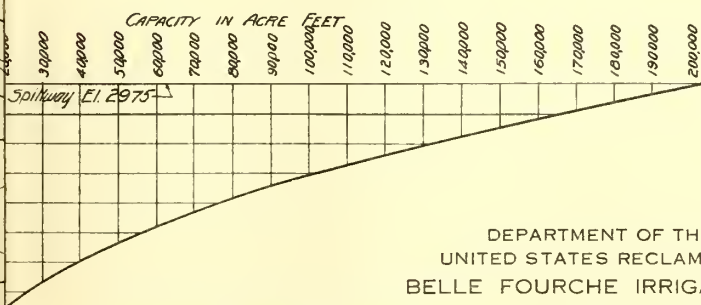
CAL SECTION OF DAM



PLAN



WASTE WEIR

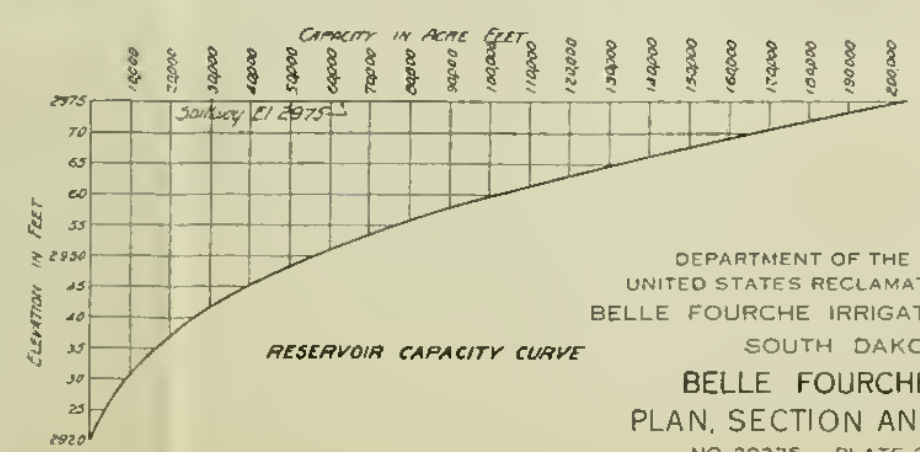


RESERVOIR CAPACITY CURVE

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BELLE FOURCHE IRRIGATION PROJECT
SOUTH DAKOTA

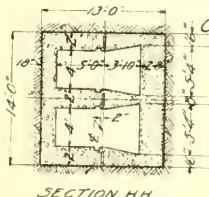
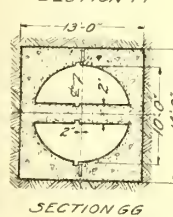
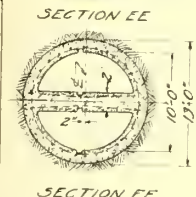
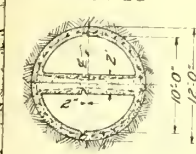
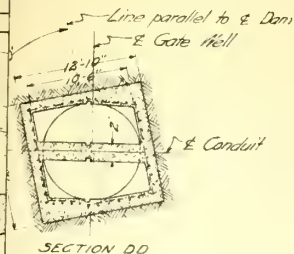
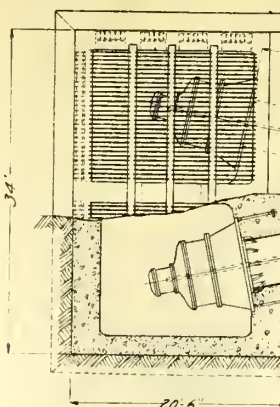
BELLE FOURCHE DAM PLAN, SECTION AND DETAILS

NO. 20375 PLATE 35 OF 88
1923

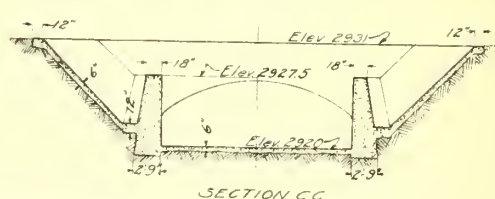
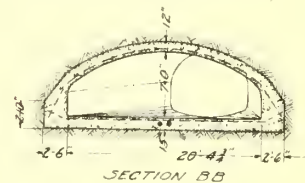
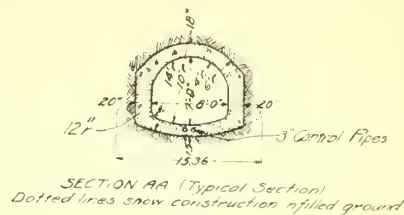


DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BELLE FOURCHE IRRIGATION PROJECT
SOUTH DAKOTA
BELLE FOURCHE DAM
PLAN, SECTION AND DETAILS
NO 20375 PLATE 35 OF 88
1923

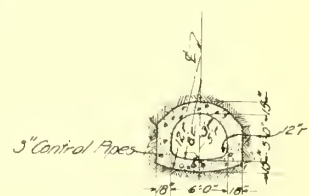
2-58" Balanced Valves



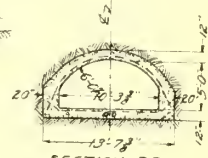
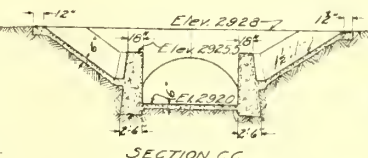
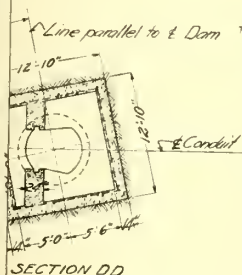
NORTH CONDUIT WELL SECTIONS



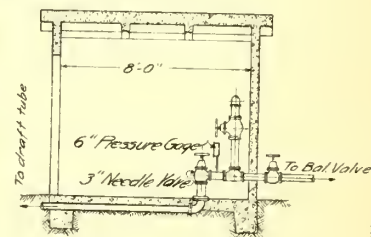
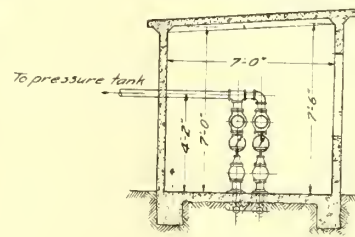
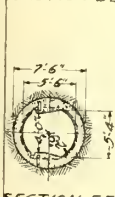
CONDUIT SECTIONS-NORTH CONDUIT



SECTION AA (Typical Section)
Dotted lines show construction in filled ground

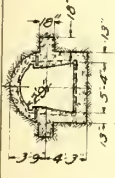
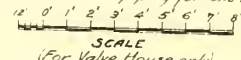


CONDUIT SECTIONS-SOUTH CONDUIT



VALVE HOUSE-NORTH AND SOUTH CONDUITS

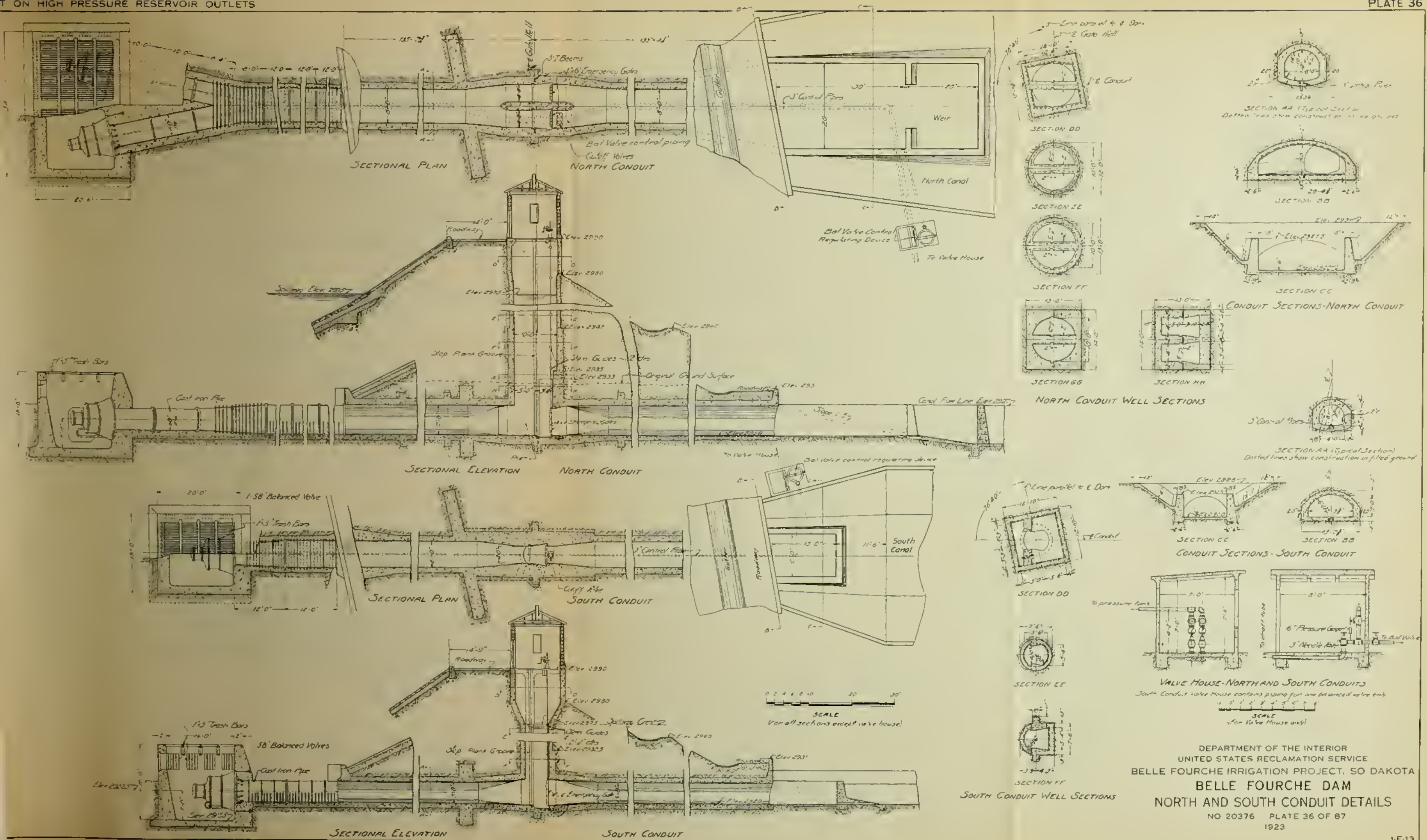
South Conduit Valve House contains piping for one balanced valve only

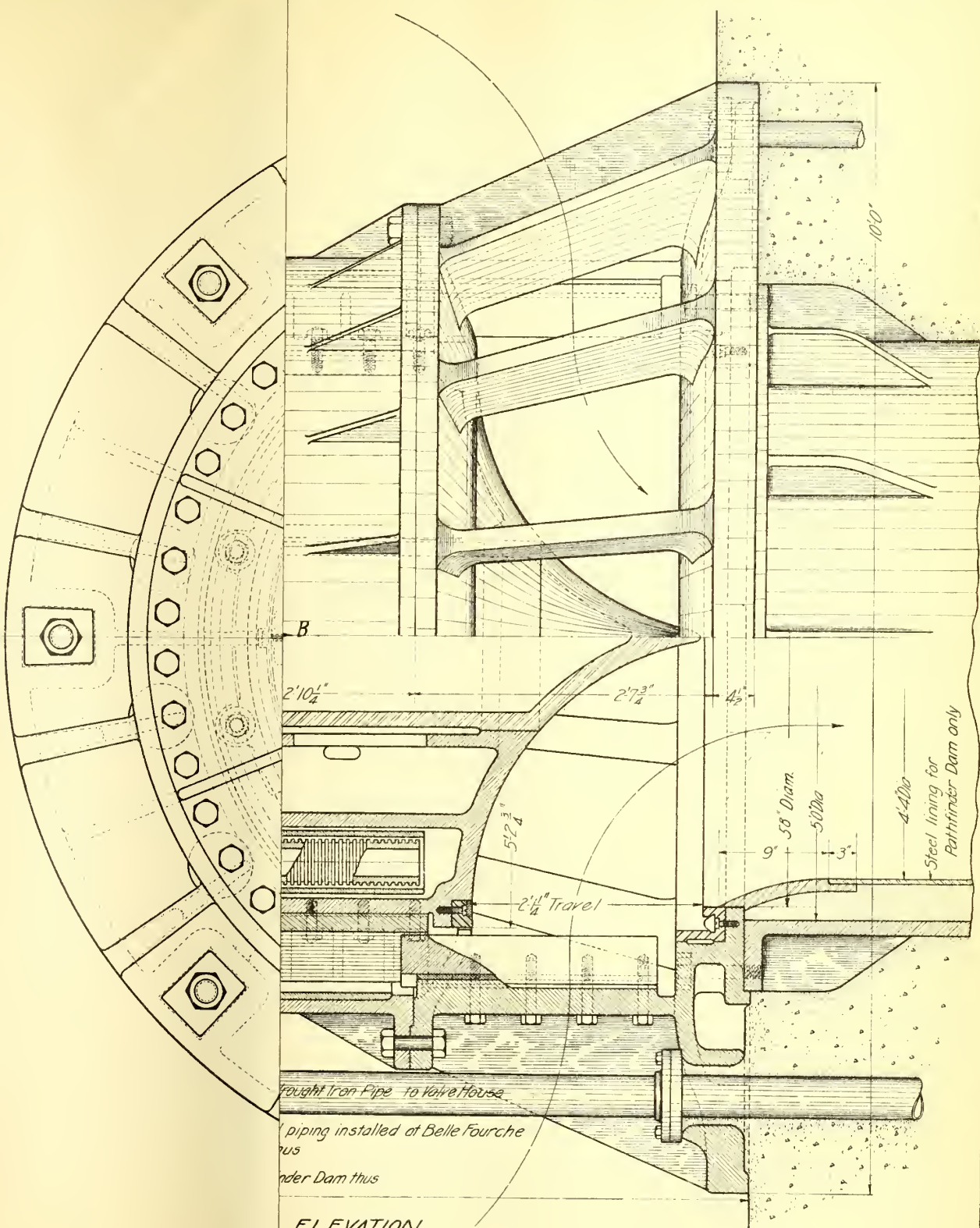


CONDUIT WELL SECTIONS

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BELLE FOURCHE IRRIGATION PROJECT, S.D. DAKOTA
BELLE FOURCHE DAM
NORTH AND SOUTH CONDUIT DETAILS

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1923





ELEVATION

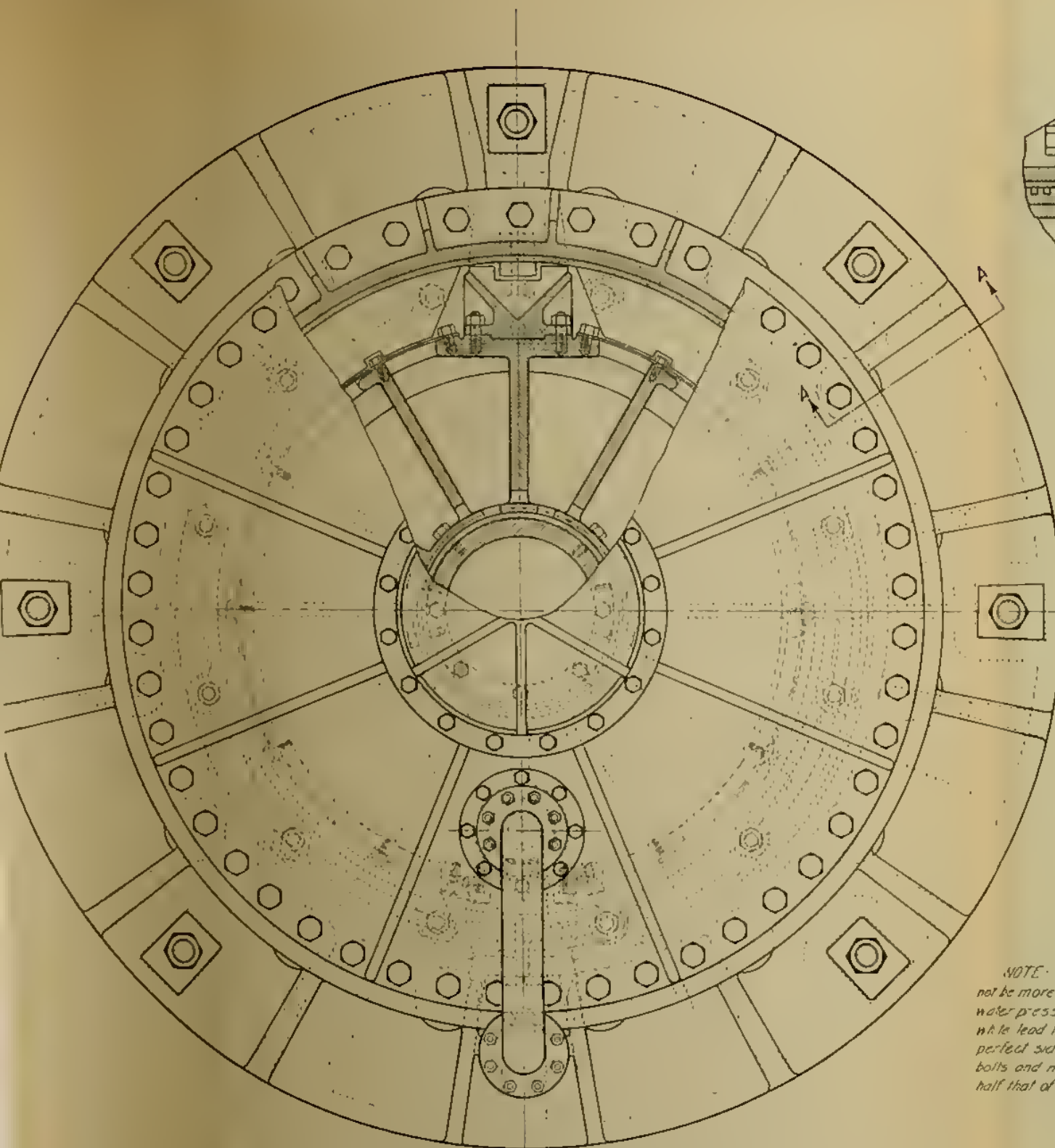
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BELLE FOURCHE IRRIGATION PROJECT, SO. DAKOTA
BELLE FOURCHE DAM
BALANCED VALVE, 58 INCH DIAMETER

from Los Angeles drawing No 2-138

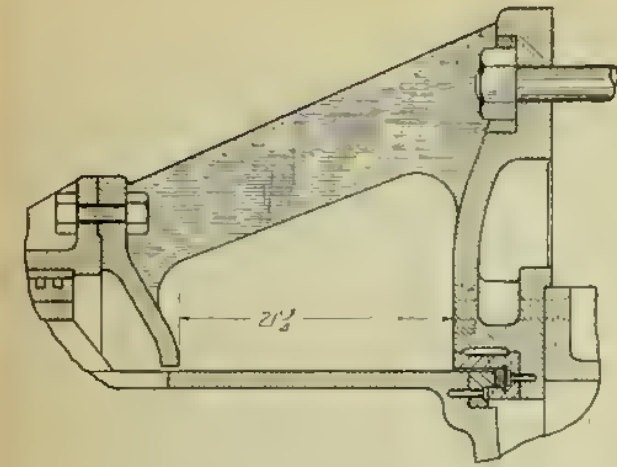
NO. 20377 PLATE 37 OF 88

1923

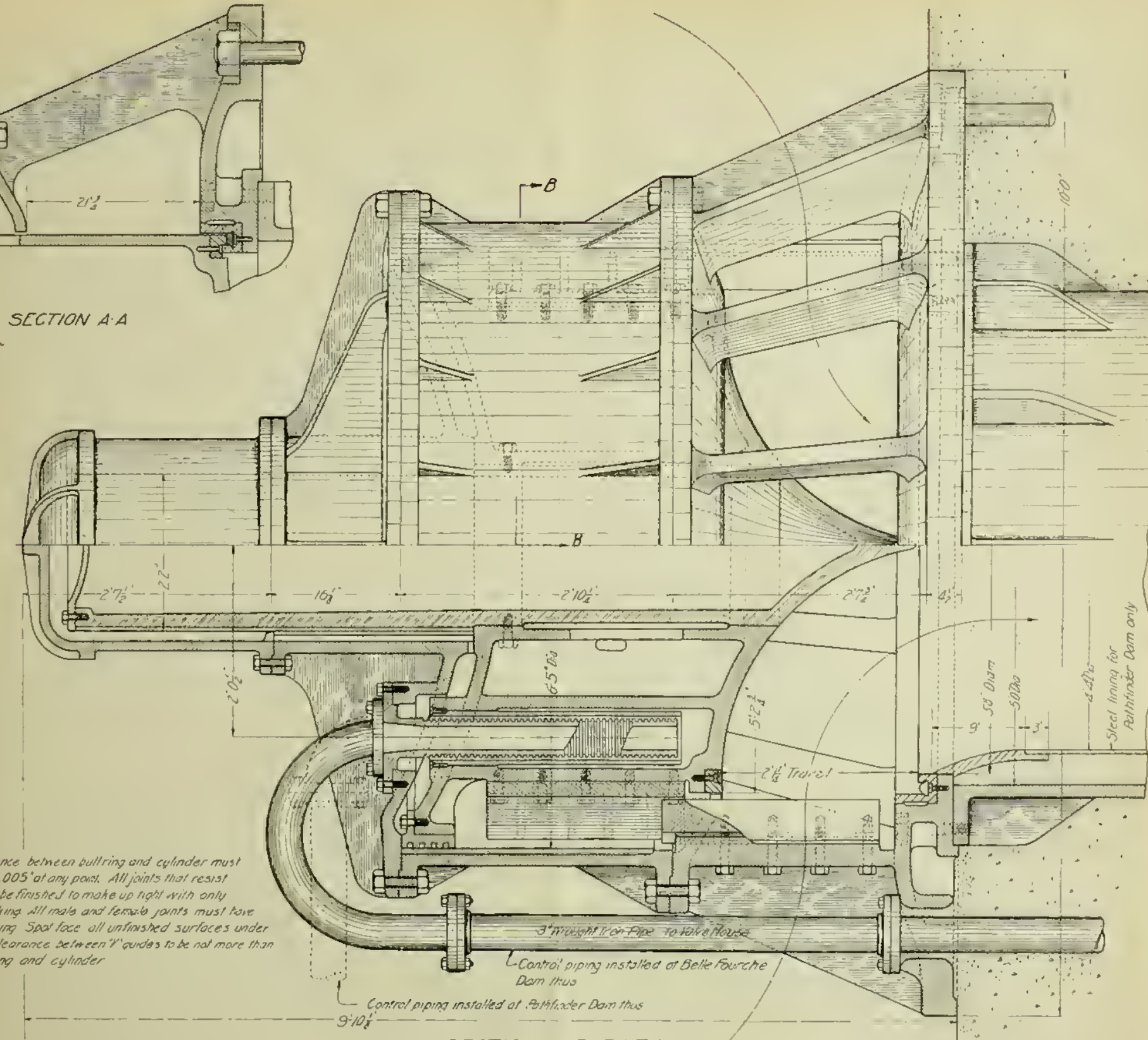
20-E-20



PLAN AND SECTION B-B

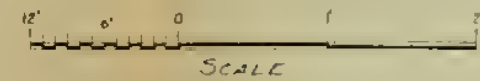


SECTION A-A



SECTIONAL ELEVATION

NOTE: Clearance between bullring and cylinder must not be more than 0.005" at any point. All joints that resist water pressure to be finished to make up tight with only white lead for packing. All male and female joints must have perfect side bearing. Spot face all unfinished surfaces under bolts and nuts. Clearance between "V" guides to be not more than half that of bullring and cylinder.



NOTE: SAME DESIGN USED FOR PATHFINDER DAM

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BELLE FOURCHE IRRIGATION PROJECT, SO. DAKOTA
BELLE FOURCHE DAM
BALANCED VALVE, 58 INCH DIAMETER
NO 20377 PLATE 37 OF 88
1923

NOTE: Retraced from Los Angeles drawing No 2-138

BILL	
N ^o	REQ'D.
3	
2	
2	
3	
6	
2	
24	
24	
1	
1	

$\frac{3}{16} \times 12$
WALL, ON
FACT A

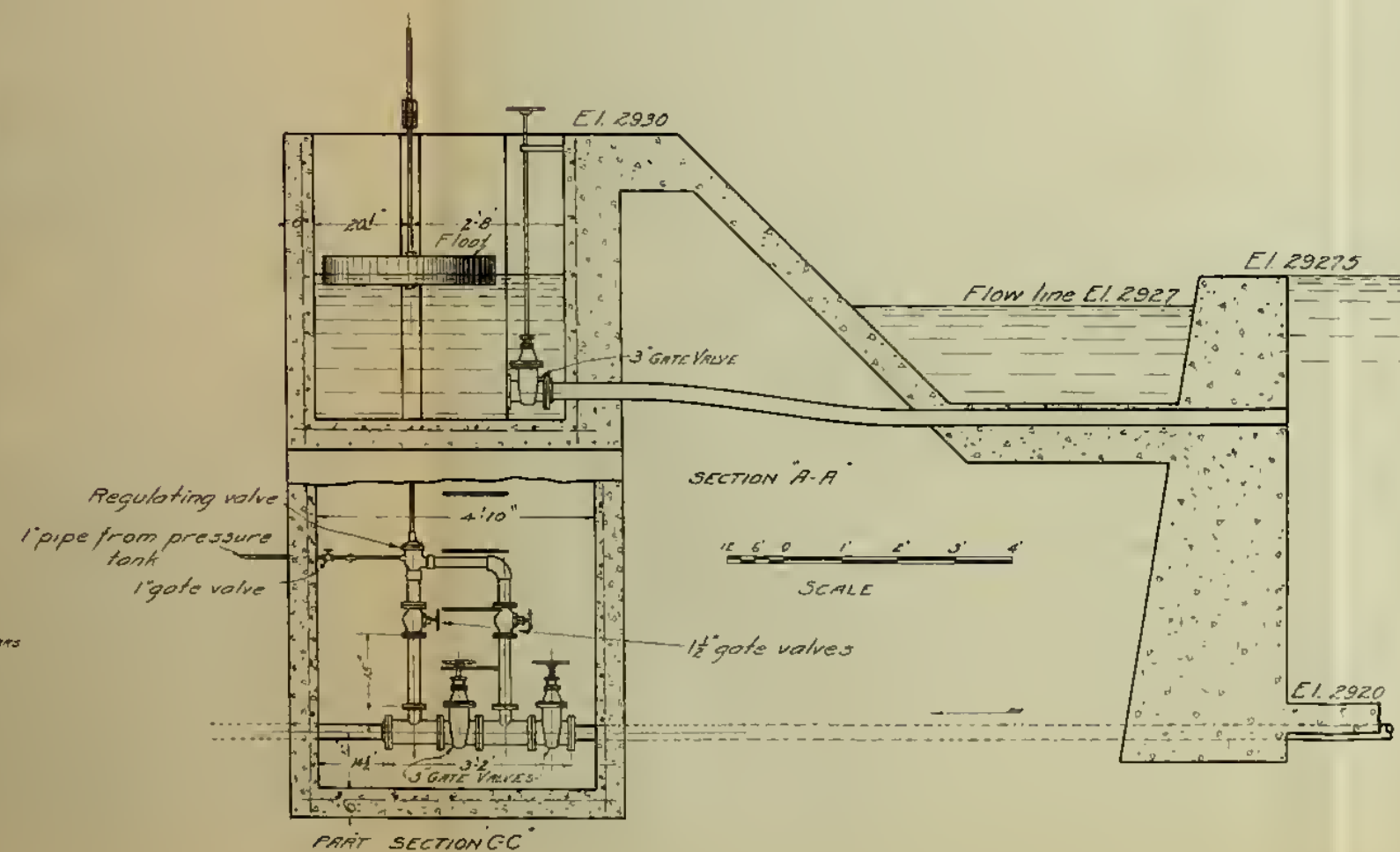
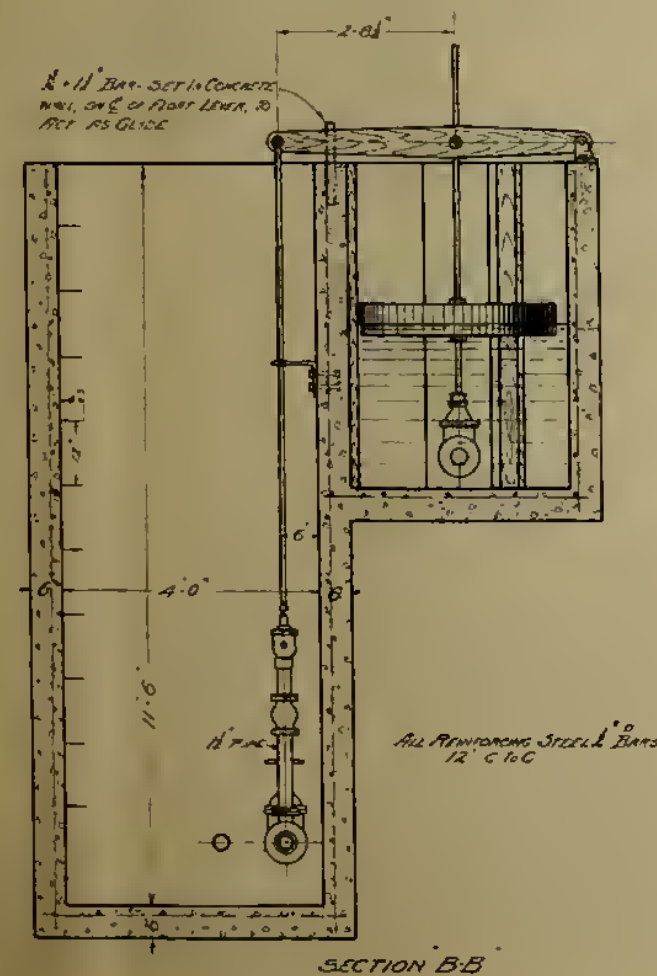
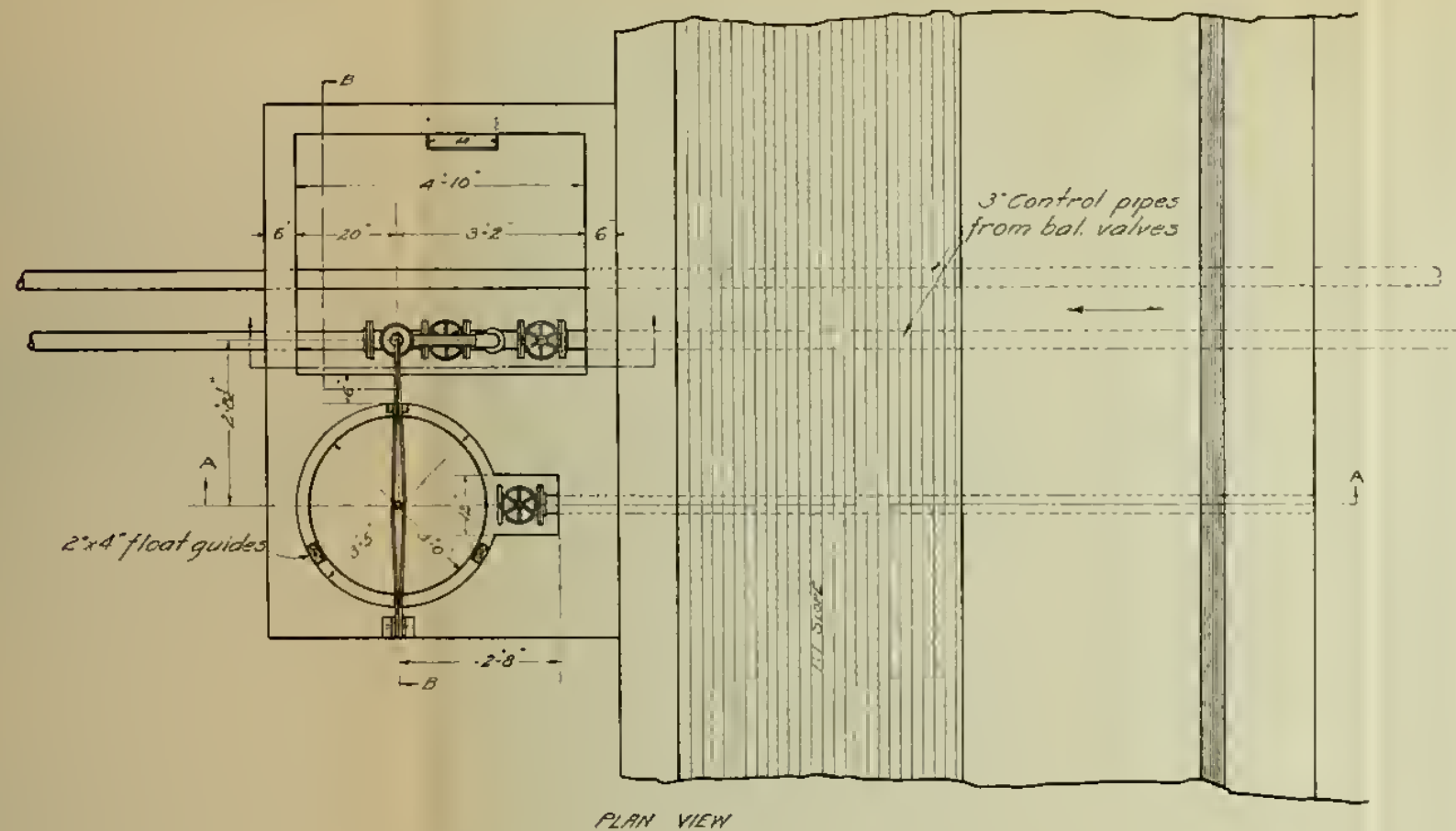


DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BELLE FOURCHE IRRIGATION PROJECT
SOUTH DAKOTA
BELLE FOURCHE DAM
BALANCED VALVE DISCHARGE REGULATOR

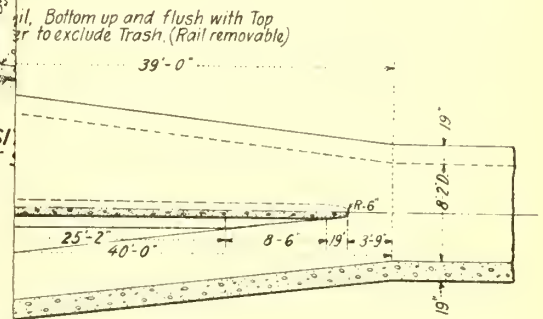
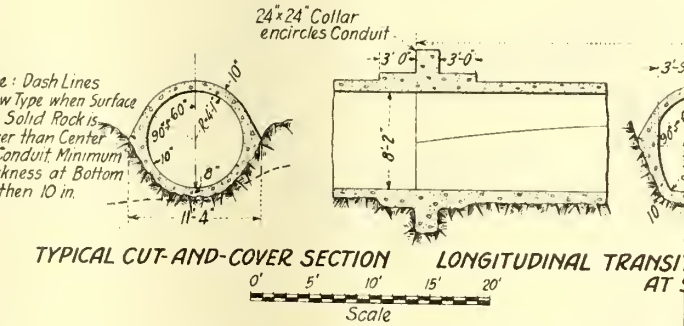
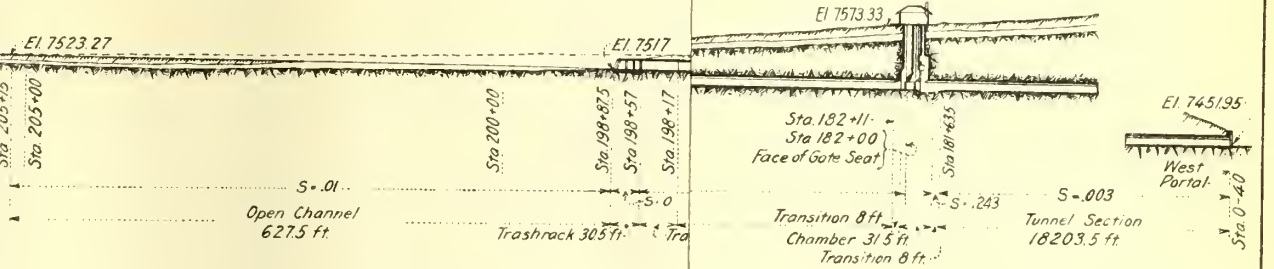
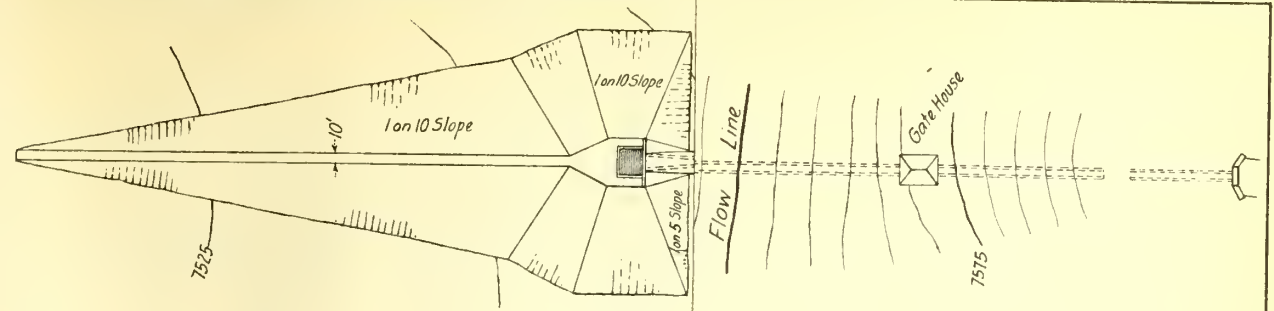
NO. 20378 PLATE 38 OF 88

1923

BILL OF MATERIAL FOR ONE REGULATOR			
NO. REQ'D.	SIZE	MATERIAL	DESCRIPTION
3	3"	C.I.	FLANGED GATE VALVES
2	1½"	"	"
2	3'3" x 1½"	"	FLANGED REDUCING TEES
3	3"	"	COMPARISON FLANGES
6	1½"	"	"
2	1½"	STD W.I.	PIPE 15' LONG JAW 20' 2000
24	½" x 2½"	50 HD	MATCH BOLTS
24	½" x 1½"	"	"
1	1"	BRASS	GATE VALVE
1	1"	"	UNION

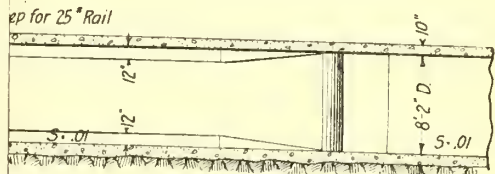


DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BELLE FOURCHE IRRIGATION PROJECT
SOUTH DAKOTA
BELLE FOURCHE DAM
BALANCED VALVE DISCHARGE REGULATOR
NO 20378 PLATE 38 OF 88
1923



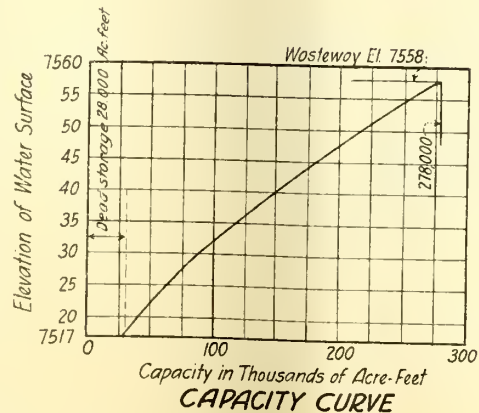
Note Reinforcement not shown

HORIZONTAL SECTION



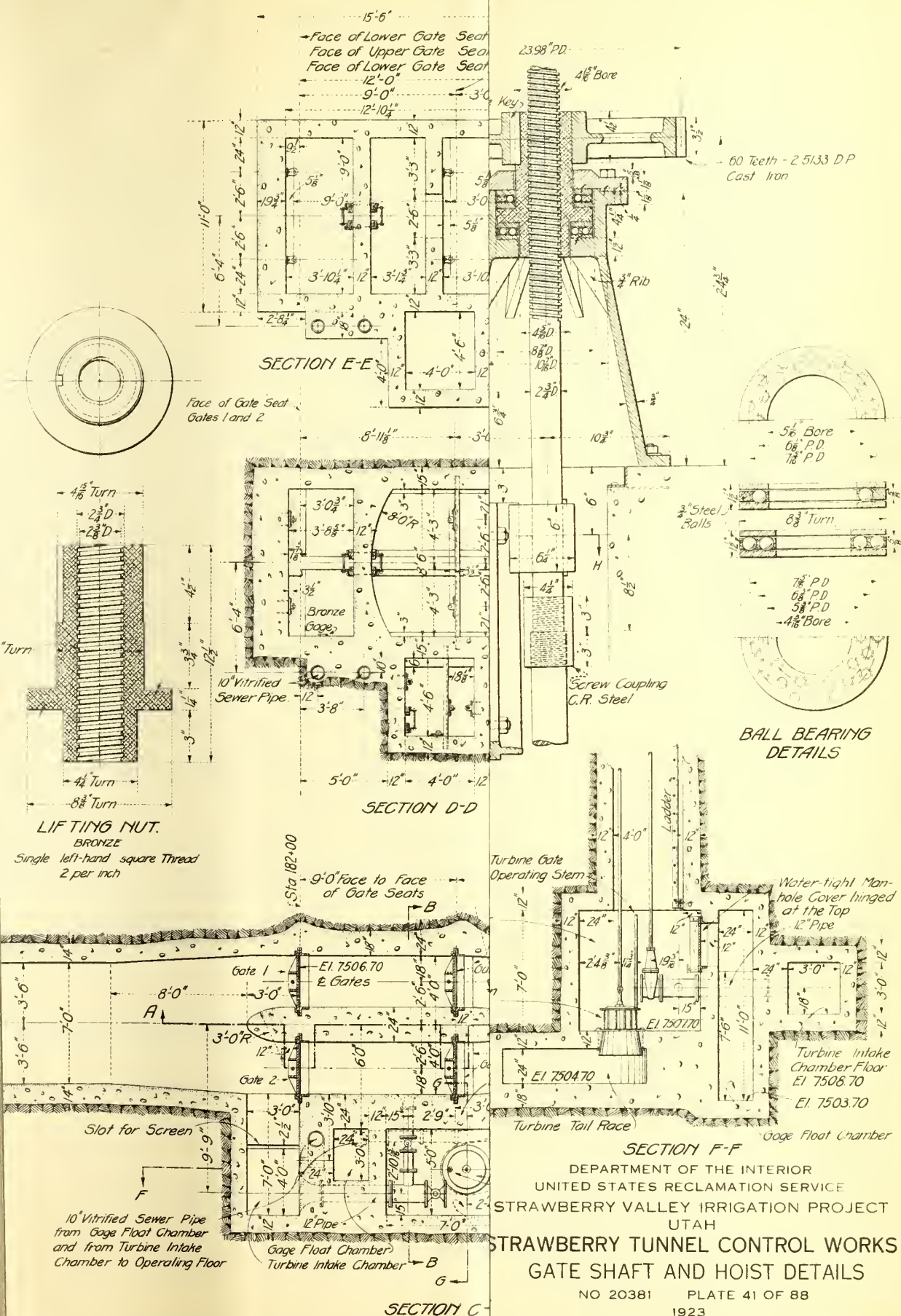
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
STRAWBERRY VALLEY IRRIGATION PROJECT
UTAH
STRAWBERRY TUNNEL CONTROL WORKS
GENERAL PLAN AND TRASH RACK DETAILS

NO. 20379 PLATE 39 OF 88
1923



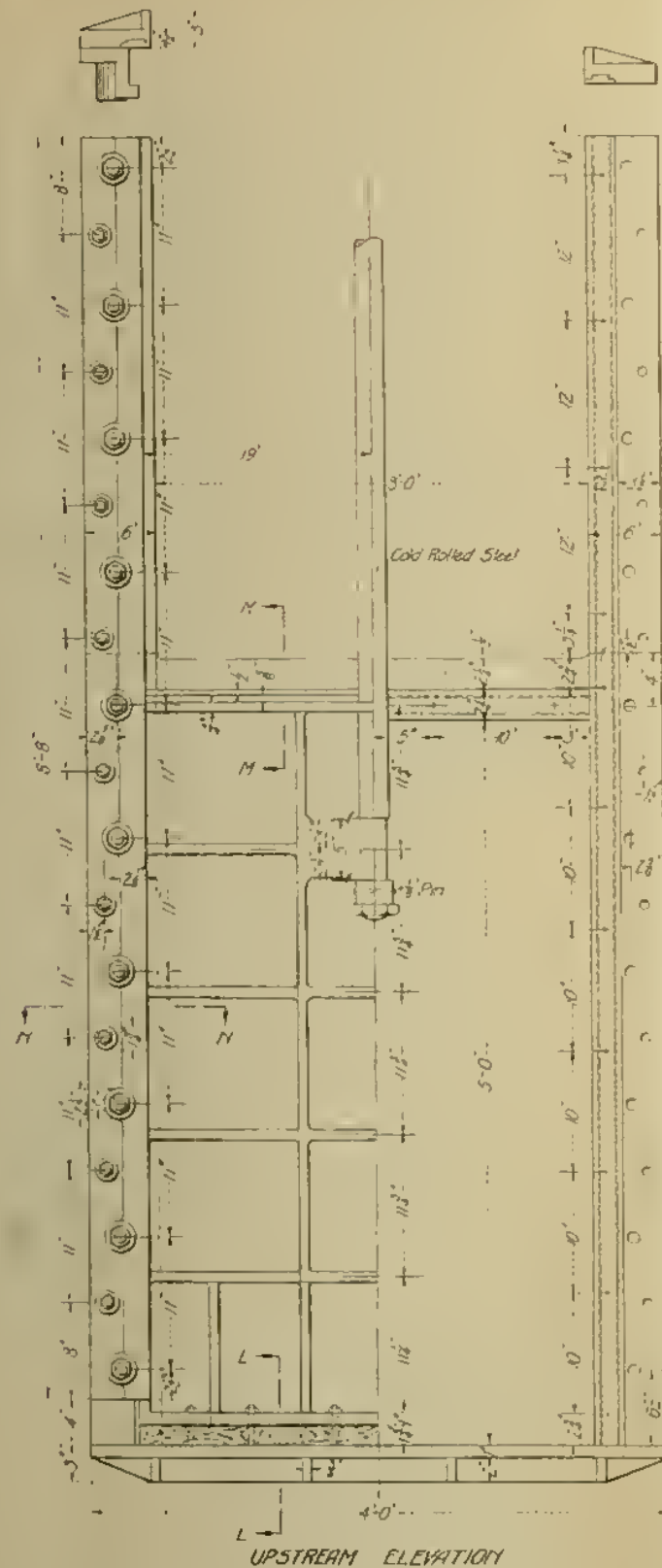
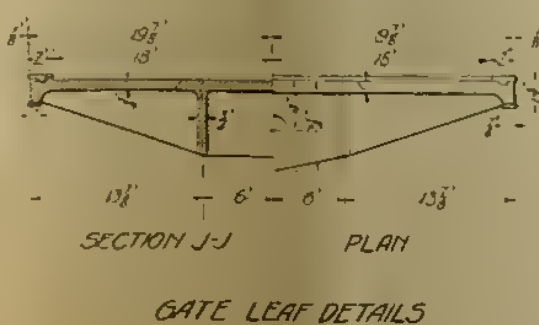
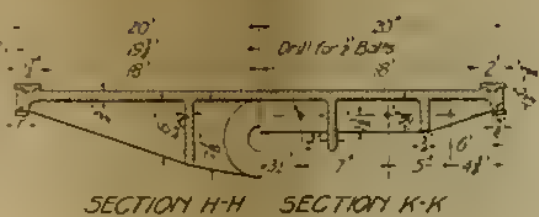








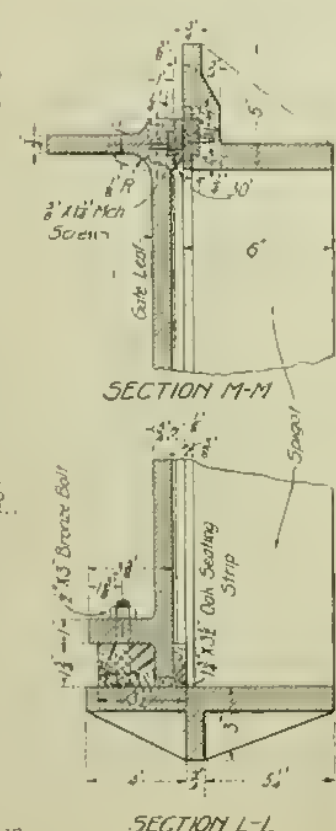
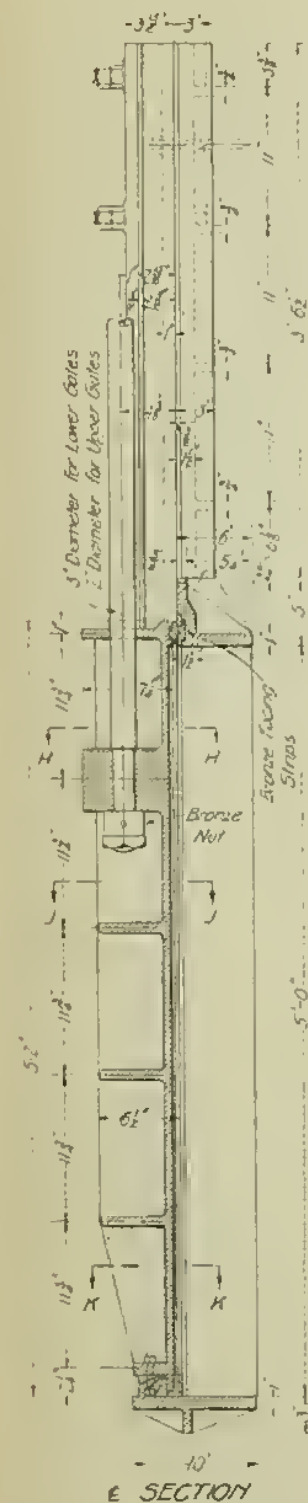




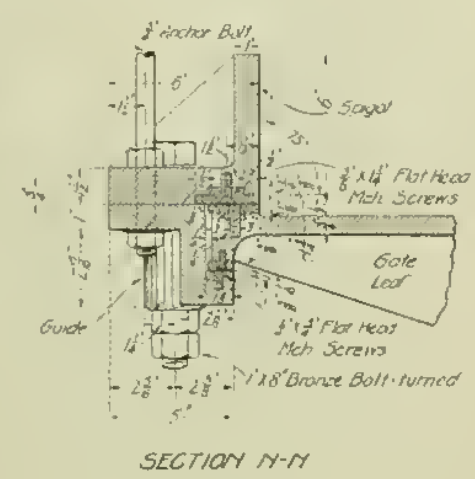
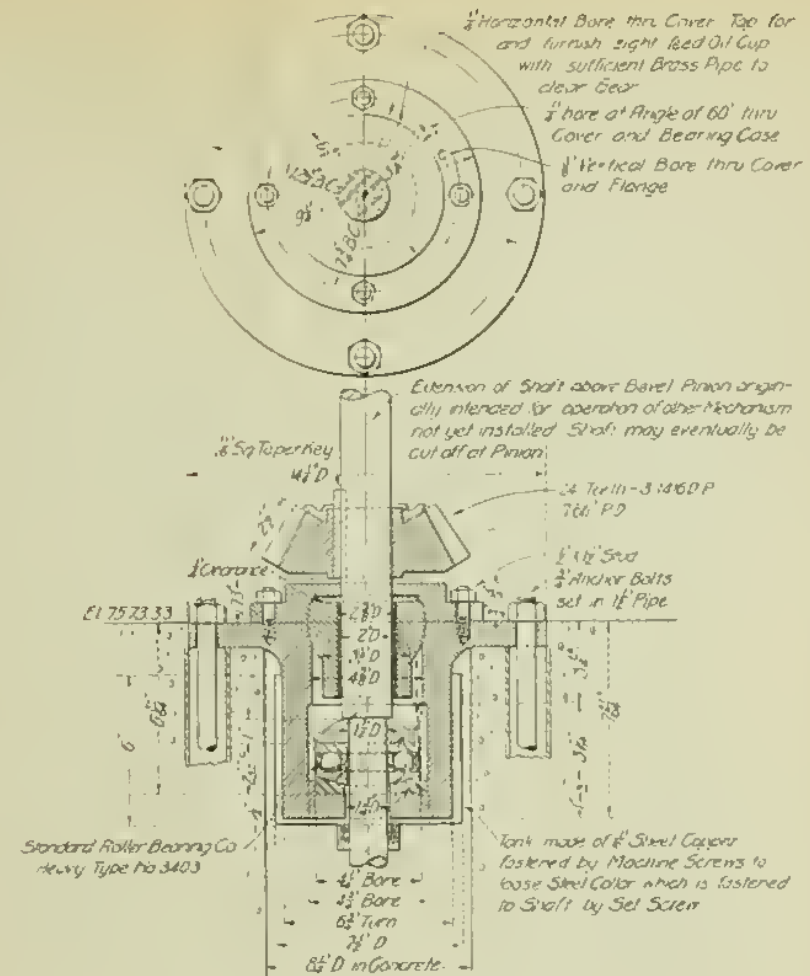
GATE ASSEMBLY

NOTE Gate and Frame of Cast Iron with Bronze Seal

Note This Drawing Compiled from Design Drawings made in the Project Office

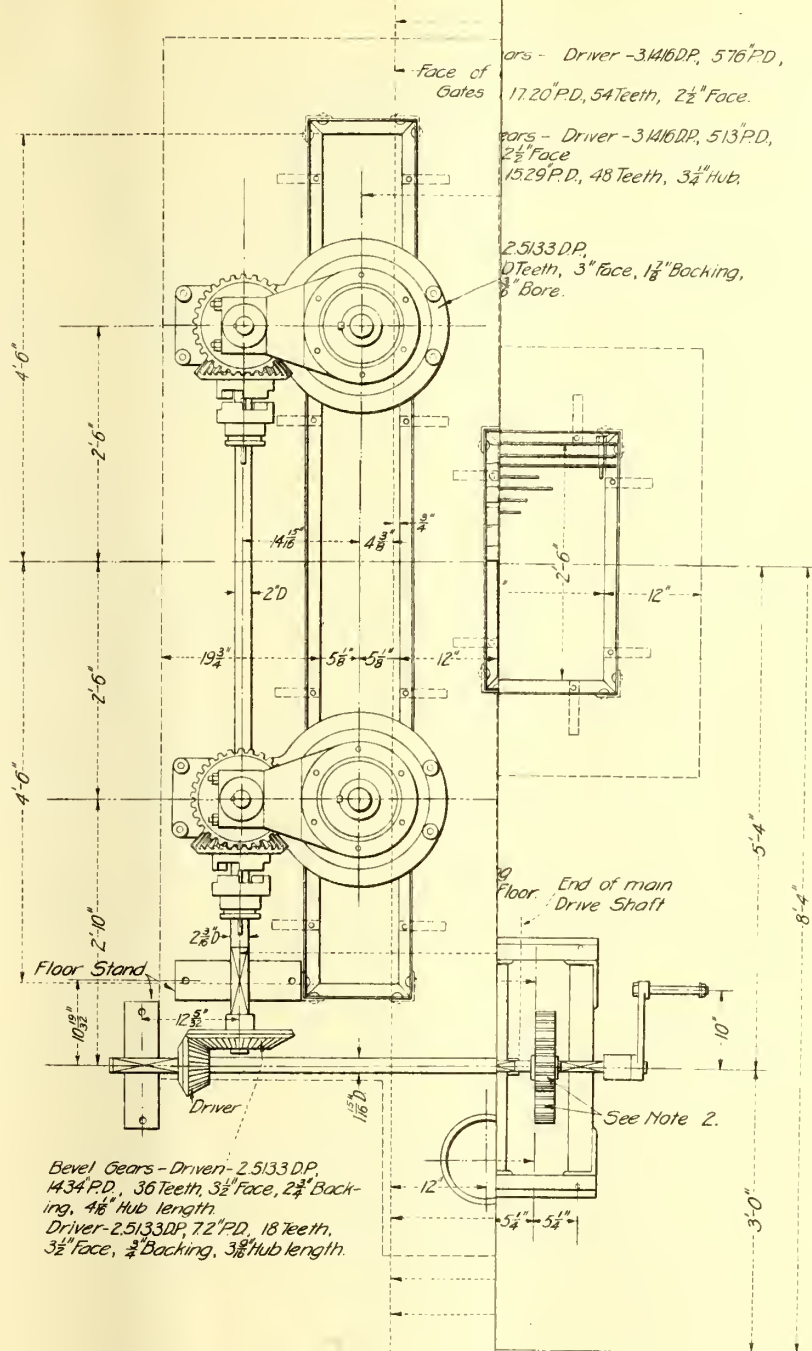


TURBINE SHAFT THRUST BEARING
CAST IRON

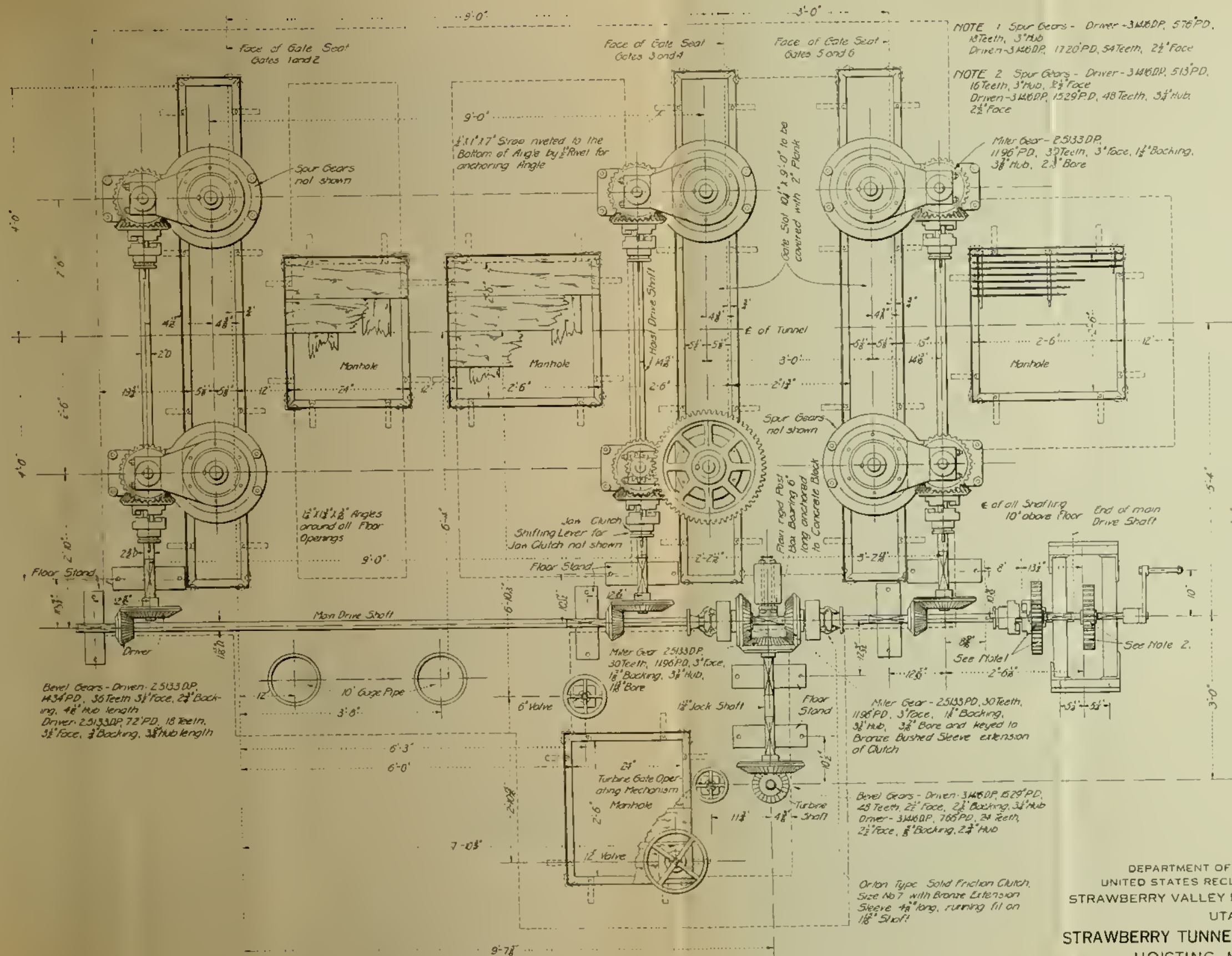


DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
STRAWBERRY VALLEY IRRIGATION PROJECT
UTAH
STRAWBERRY TUNNEL CONTROL WORKS
GATE AND THRUST BEARING DETAILS

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1923



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
STRAWBERRY VALLEY IRRIGATION PROJECT
UTAH
STRAWBERRY TUNNEL CONTROL WORKS
HOISTING MACHINERY
NO. 20383 PLATE 43 OF 87
1923



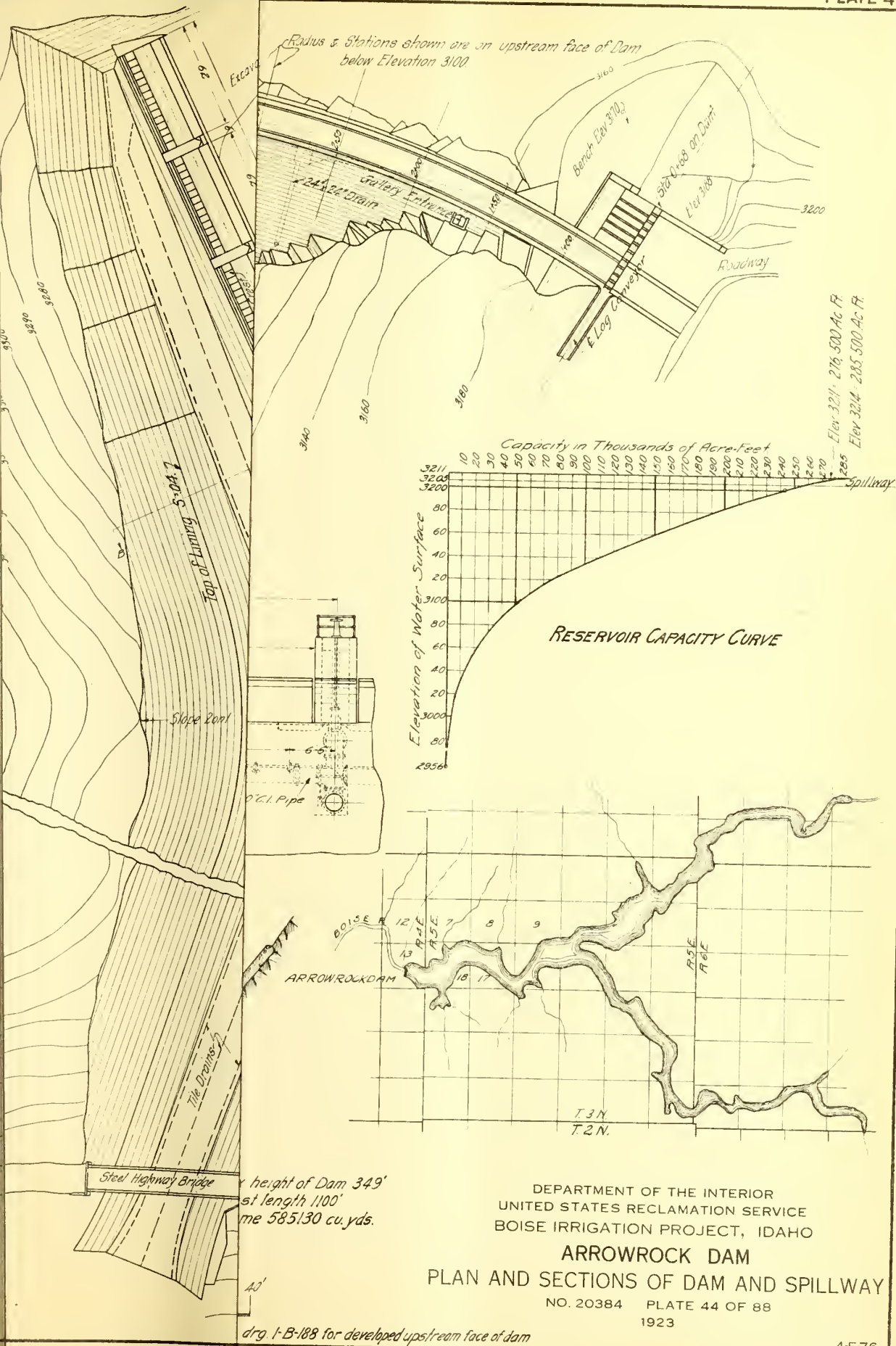
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
STRAWBERRY VALLEY IRRIGATION PROJECT
UTAH
STRAWBERRY TUNNEL CONTROL WORKS
HOISTING MACHINERY

NO 20383 PLATE 43 OF 87
1923

Notes This Drawing compiled from Design Drawings made in the Project Office

Set 5

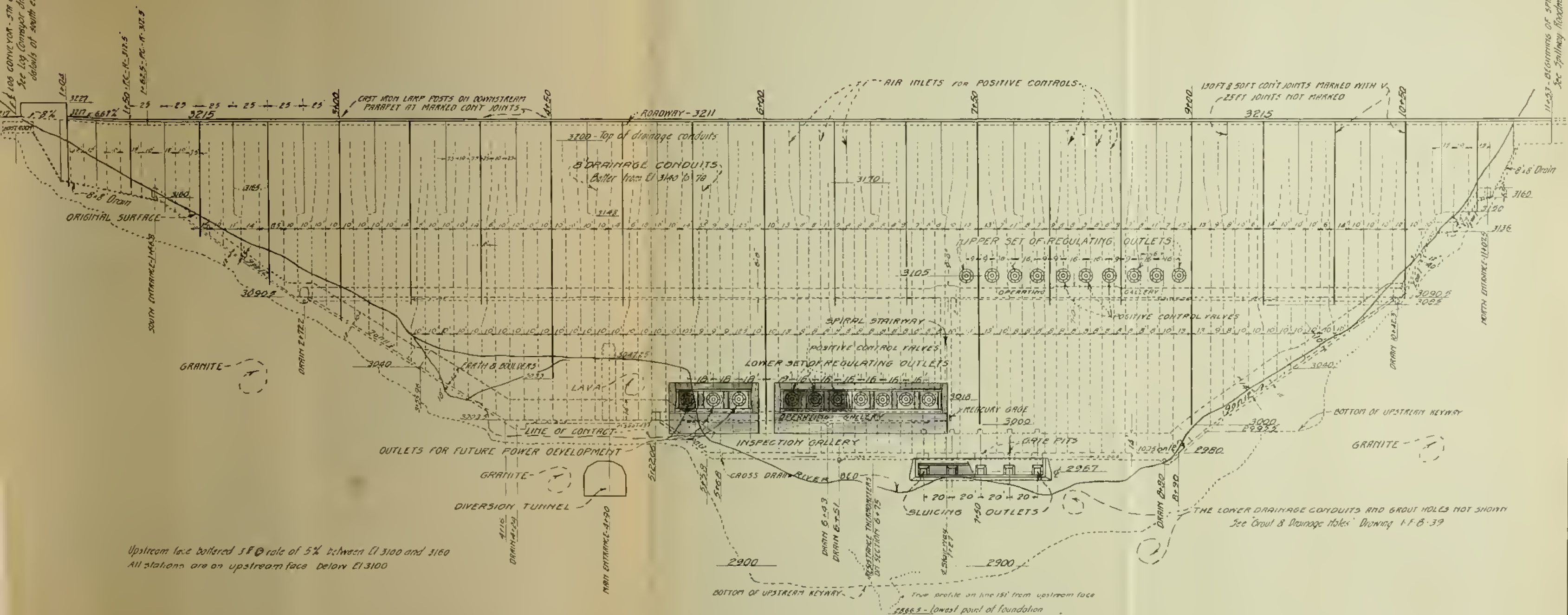
27-C-28



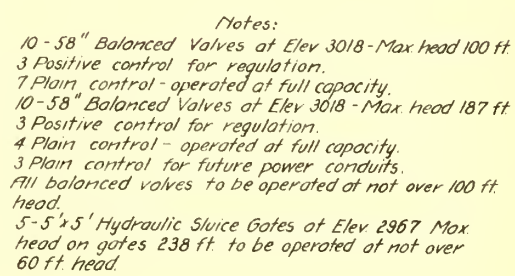
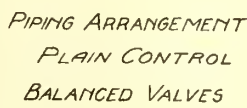
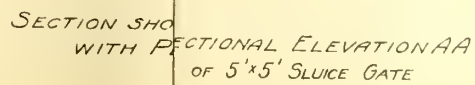
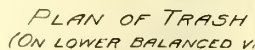


See 100 CONVEYOR - STA 0+00
See 100 CONVEYOR drawings for
details of south end of Dam

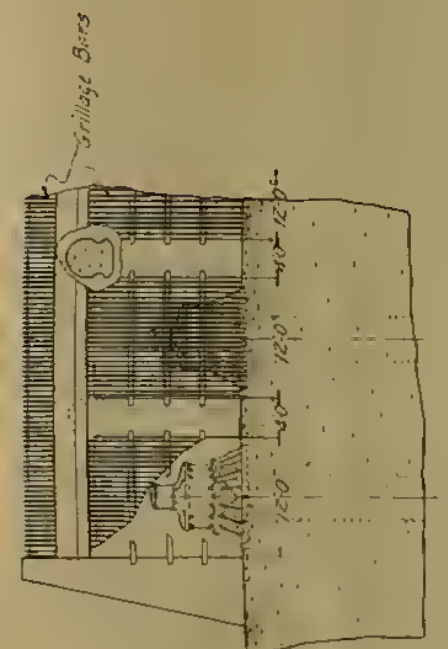
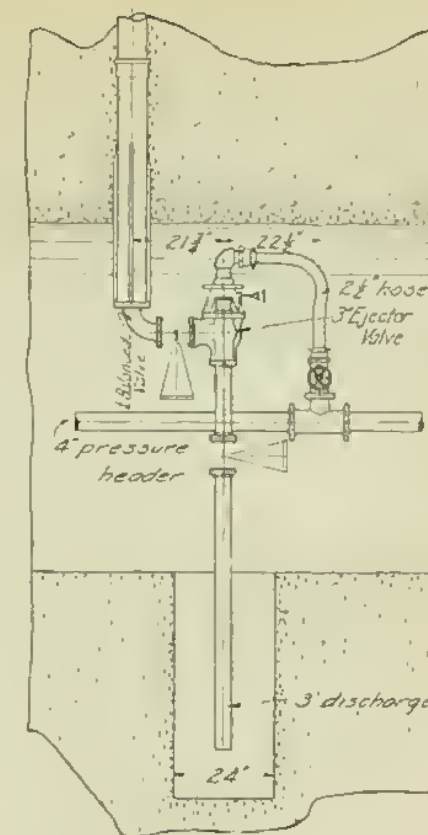
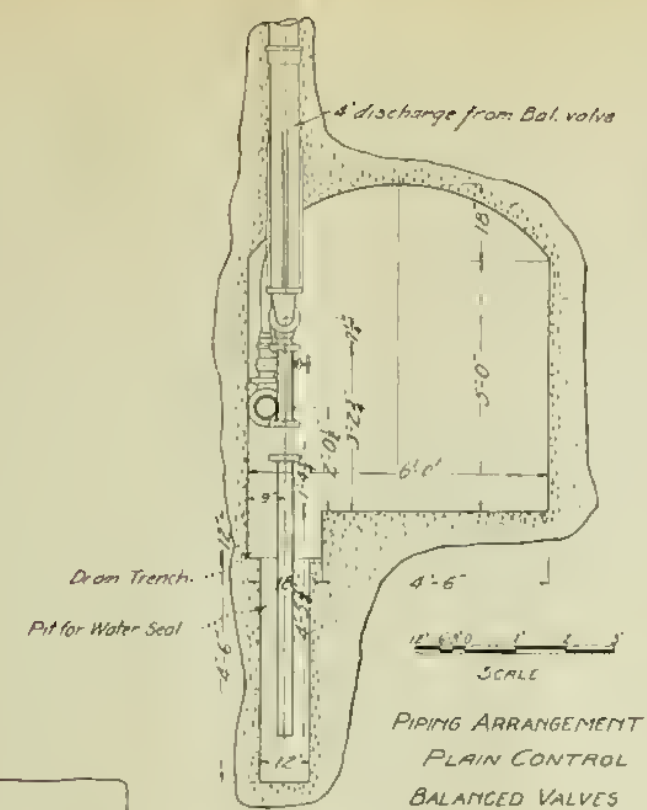
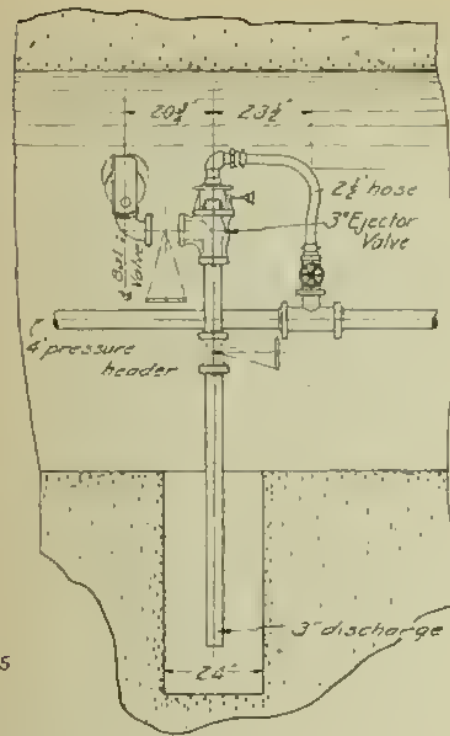
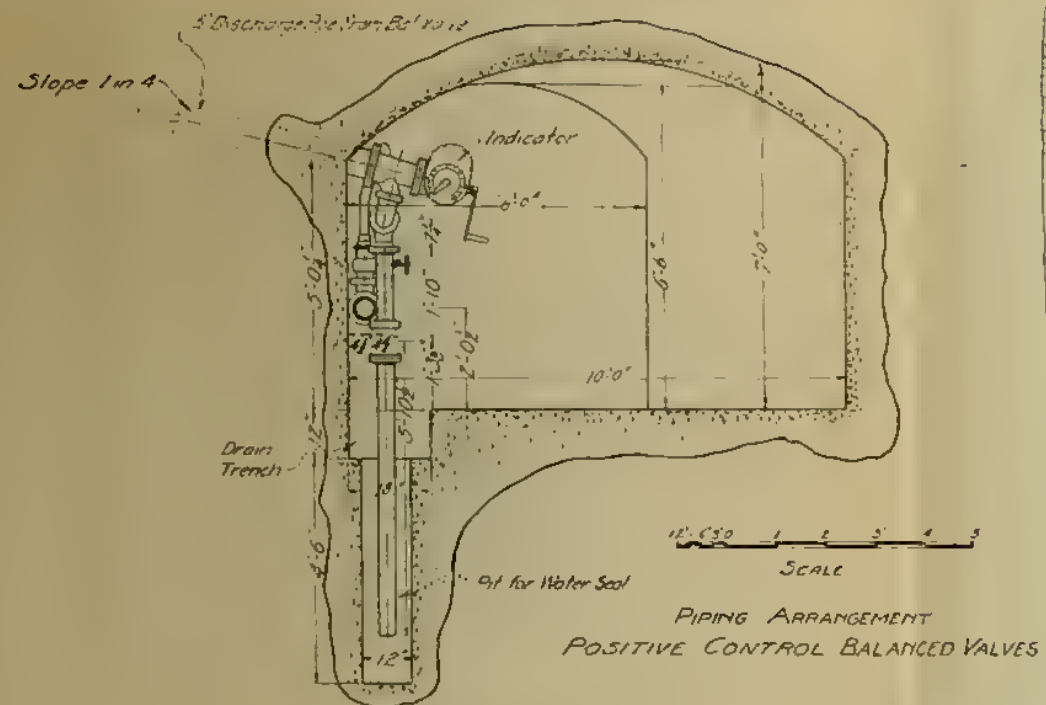
See 11-53 - Beginning of spillway road
See Spillway Roadway for details of north end of Dam



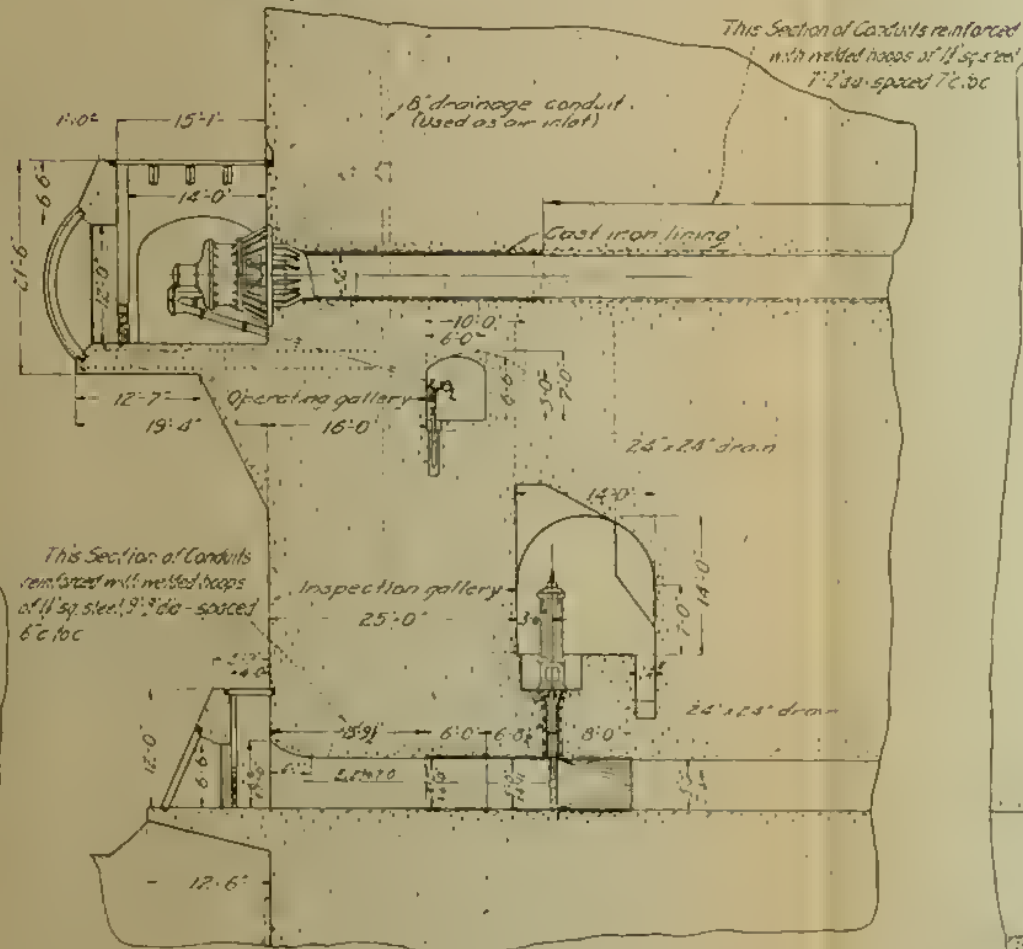
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BOISE IRRIGATION PROJECT IDAHO
ARROWROCK DAM
UPSTREAM FACE OF DAM
NO 20385 PLATE 45 OF 88
1923



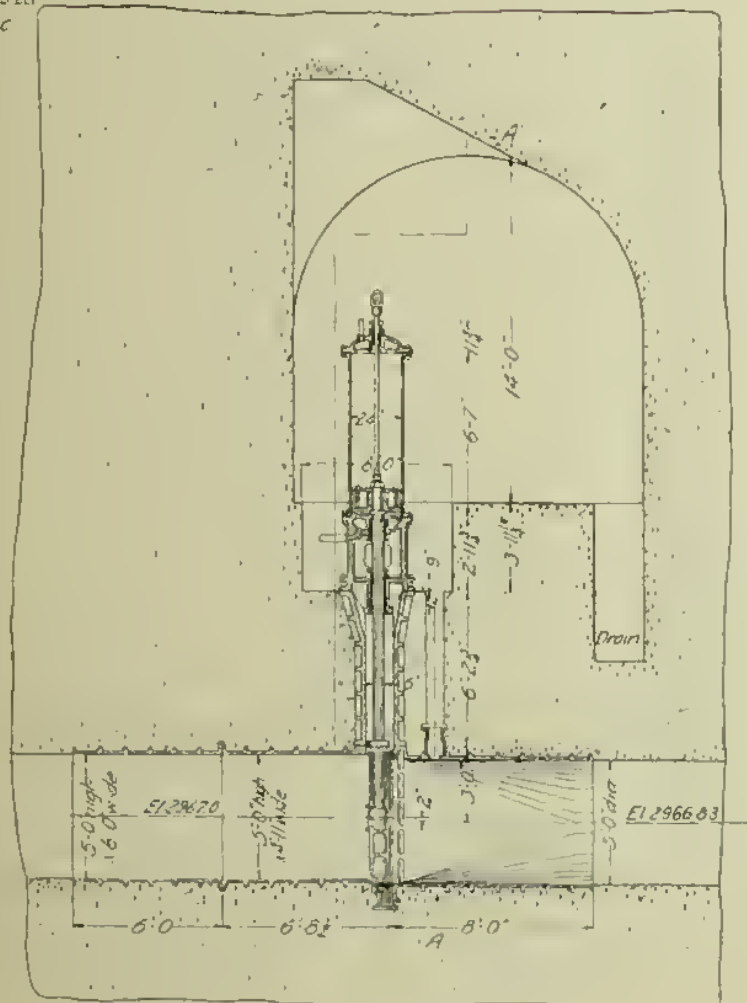
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BOISE IRRIGATION PROJECT, IDAHO
ARROWROCK DAM
BALANCED VALVE
AND SLUICE GATE INSTALLATION
NO. 20386 PLATE 46 OF 88
1923



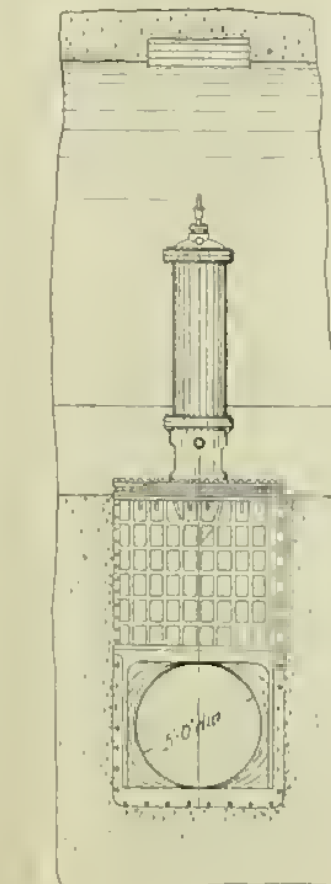
PLAN OF TRASH RACK
(ON LOWER BALANCED VALVES ONLY)



SECTION SHOWING SLUICE GATE AND BALANCED VALVE
WITH POSITIVE CONTROL



SECTION THRU 5'x5' SLUICE GATE
5 Gates installed - Max head 238 ft

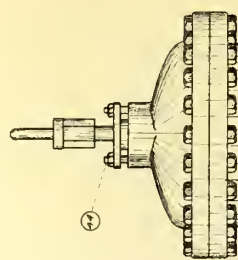


SECTIONAL ELEVATION A-A
OF 5'x5' SLUICE GATE

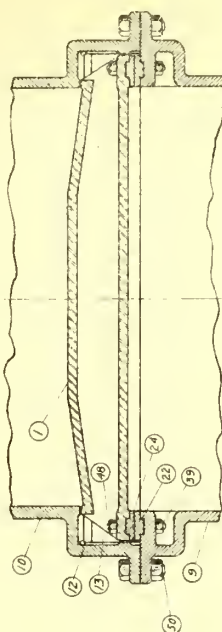
Notes:

- 10'-58" Balanced Valves at Elev 3018 - Max head 100 ft
- 3 Positive control for regulation
- 7 Plain control - operated at full capacity
- 10'-58" Balanced Valves at Elev 3018 - Max head 187 ft
- 3 Positive control for regulation
- 4 Plain control - operated at full capacity
- 3 Plain control for future power conduits
- All balanced valves to be operated at not over 100 ft head
- 5'-5'x5' Hydraulic Sluice Gates at Elev 2967 Max head on gates 238 ft to be operated at not over 60 ft head

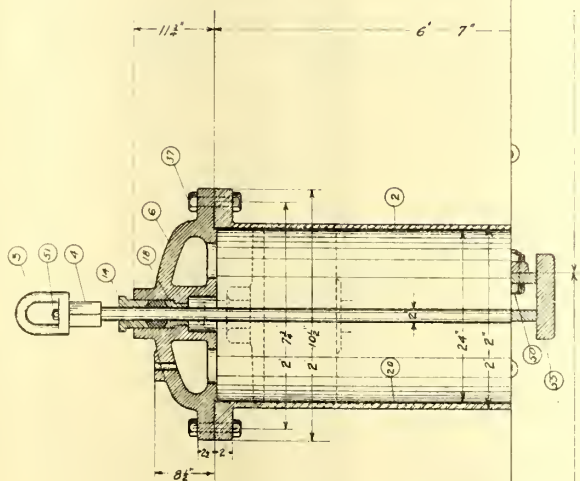
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BOISE IRRIGATION PROJECT, IDAHO
**ARROWROCK DAM
BALANCED VALVE
AND SLUICE GATE INSTALLATION**
NO 20386 PLATE 46 OF 88
1923



REAR ELEVATION



SECTION AA

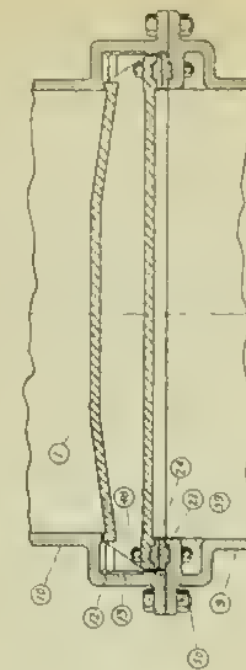
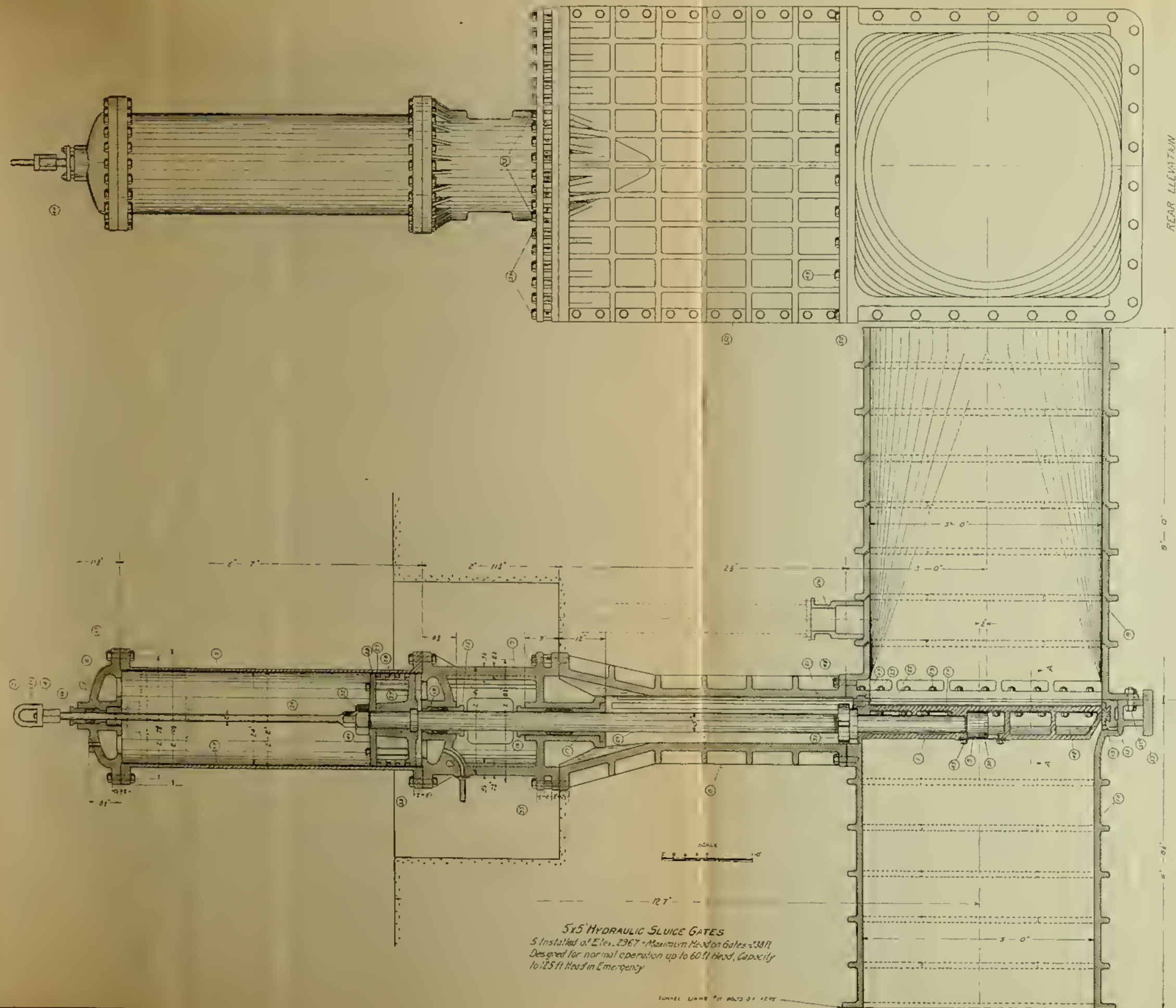


LONGITUDINAL SECTION

NO.	QTY	MATERIAL	NAME OF PART	REMARKS
1	1	CAST IRON	GATE LEAF	SEE BING 13-300
2	1	"	CYLINDER	" 13-300
3	1	"	SAFETY LOCK KEY	" 13-300
4	1	"	NUT	" 13-300
5	1	"	PISTON COVER	" 13-300
6	1	"	CAST IRON CYLINDER HEAD	" 13-300
7	1	"	GATE PISTON COVER	" 13-300
8	1	"	GATE PISTON (TWO PIECES)	" 13-300
9	1	"	DISCHARGE PIPE	" 13-300
10	1	"	INLET PIPE	" 13-300
11	1	"	TUNNEL LINING	" 13-300
12	1	"	GATE SEAL	" 13-300
13	1	"	GATE SEAL FILLS	" 13-300
14	1	"	ON BRACKET'S STOPPING END GLAND	" 13-300
15	1	"	"	" 13-300
16	1	"	"	" 13-300
17	1	"	"	" 13-300
18	1	"	"	" 13-300
19	1	"	"	" 13-300
20	1	"	"	" 13-300
21	2 (EACH)	"	GATE GUIDE	" 13-300
22	2 (EACH)	"	"	" 13-300
23	1	"	SEAL	" 13-300
24	2 (EACH)	"	"	" 13-300
25	1	"	"	" 13-300
26	3	"	BULL RING	" 13-300
27	4	"	PISTON RINGS	" 13-300
28	1	"	PISTON HEAD	" 13-300
29	1	"	GATE STEM	" 13-300
30	1	"	GATE STEM LOCK NUT	" 13-300
31	1	"	ADJUSTING NUT	" 13-300
32	1	"	PISTON LOCK NUT	" 13-300
33	1	"	PISTON BOLT	" 13-300
34	1	"	INDICATOR ROD	" 13-300
35	10	"	SCREW NUTS FOR PISTON SETS	" 13-300
36	20	"	"	" 13-300
37	20	"	BOLTS & NUTS - CYLINDER HEAD	" 13-300
38	20	"	"	" 13-300
39	20	"	"	" 13-300
40	10	"	"	" 13-300
41	10	"	"	" 13-300
42	10	"	"	" 13-300
43	10	"	"	" 13-300
44	10	"	"	" 13-300
45	10	"	"	" 13-300
46	10	"	"	" 13-300
47	10	"	"	" 13-300
48	10	"	"	" 13-300
49	10	"	"	" 13-300
50	10	"	"	" 13-300
51	10	"	"	" 13-300
52	10	"	"	" 13-300
53	10	"	"	" 13-300
54	10	"	"	" 13-300
55	10	"	"	" 13-300
56	10	"	"	" 13-300
57	10	"	"	" 13-300
58	10	"	"	" 13-300
59	10	"	"	" 13-300
60	10	"	"	" 13-300
61	10	"	"	" 13-300
62	10	"	"	" 13-300
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82	10	"	"	" 13-300
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100	10	"	"	" 13-300

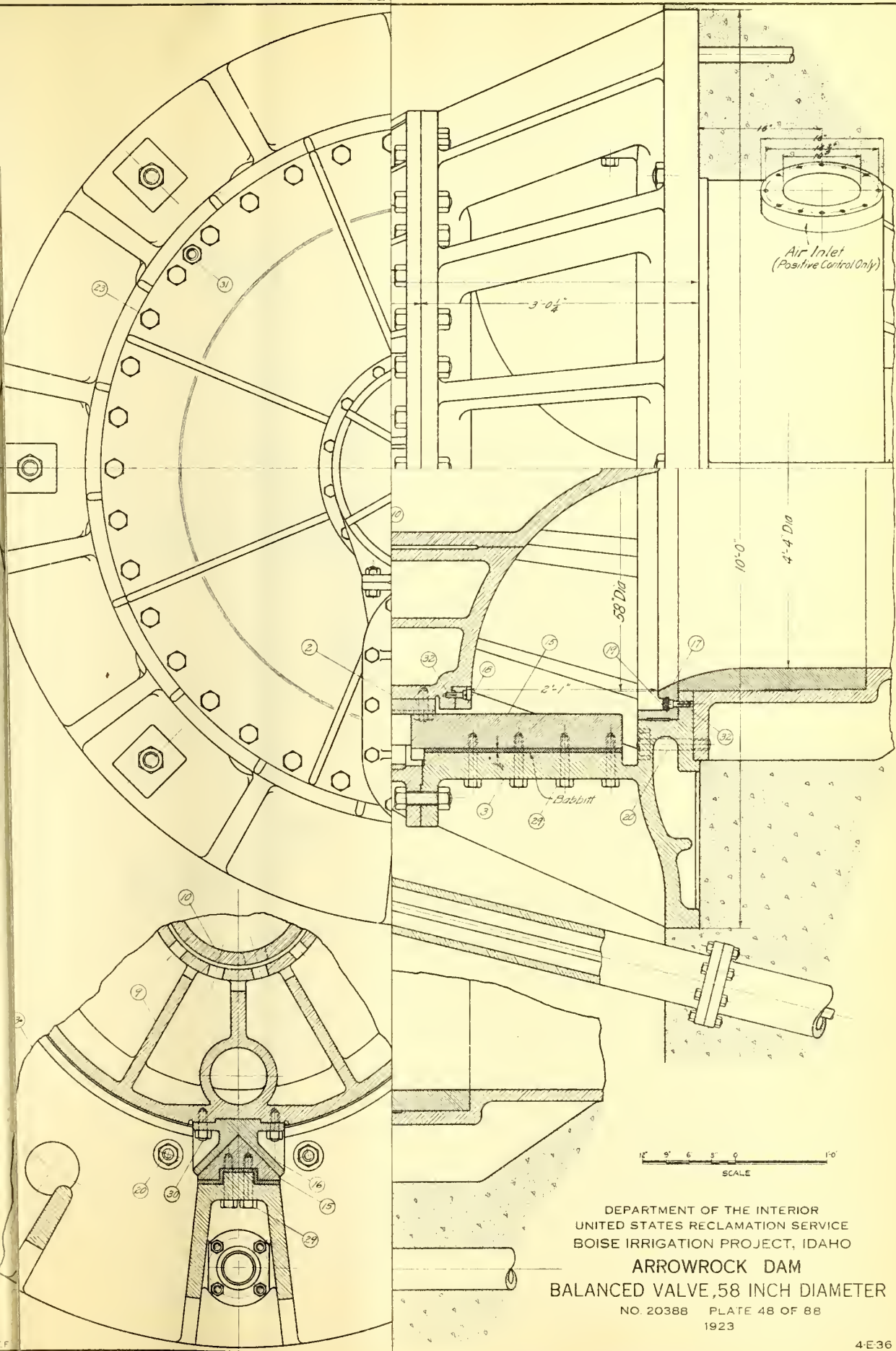
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BOISE IRRIGATION PROJECT, IDAHO
ARROWROCK DAM
HIGH PRESSURE GATES, 5 X 5 FEET

NO. 20387 PLATE 47 OF 88
1923



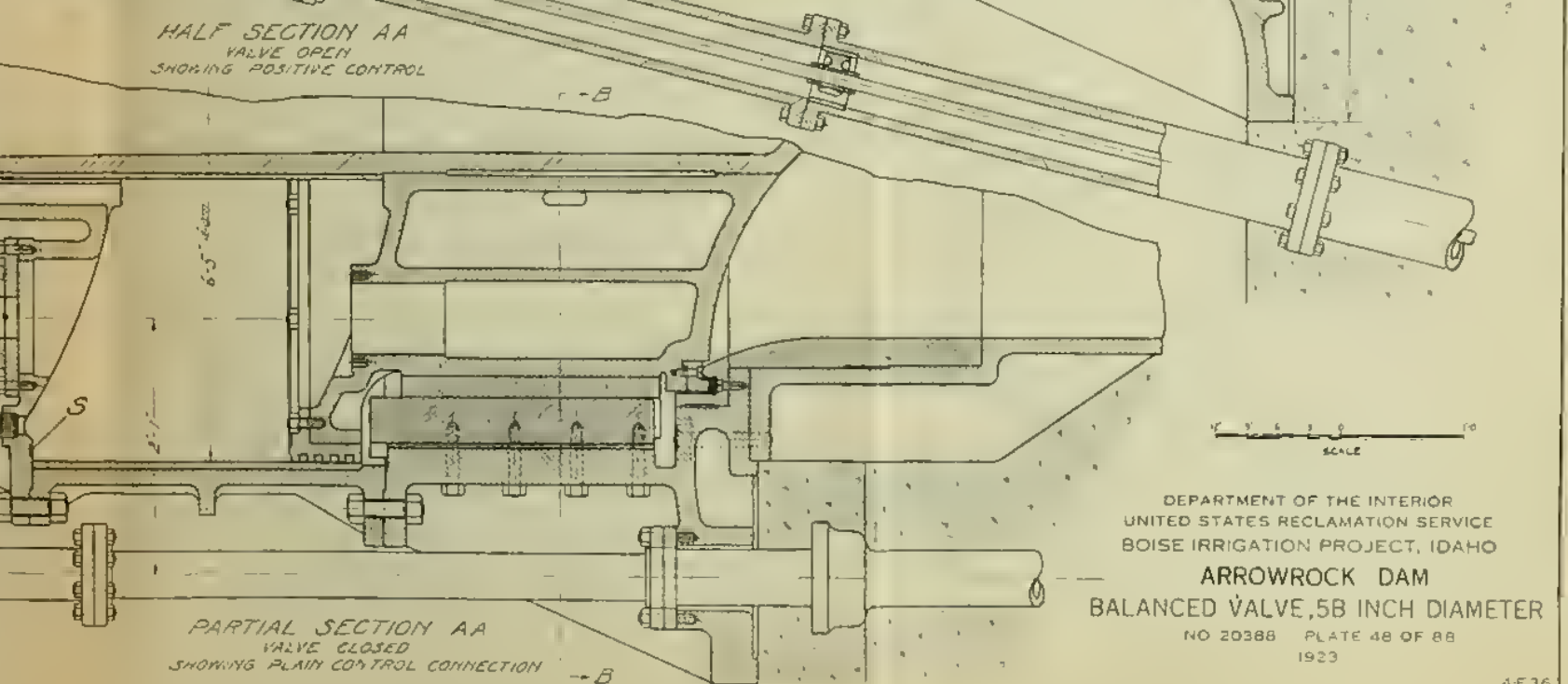
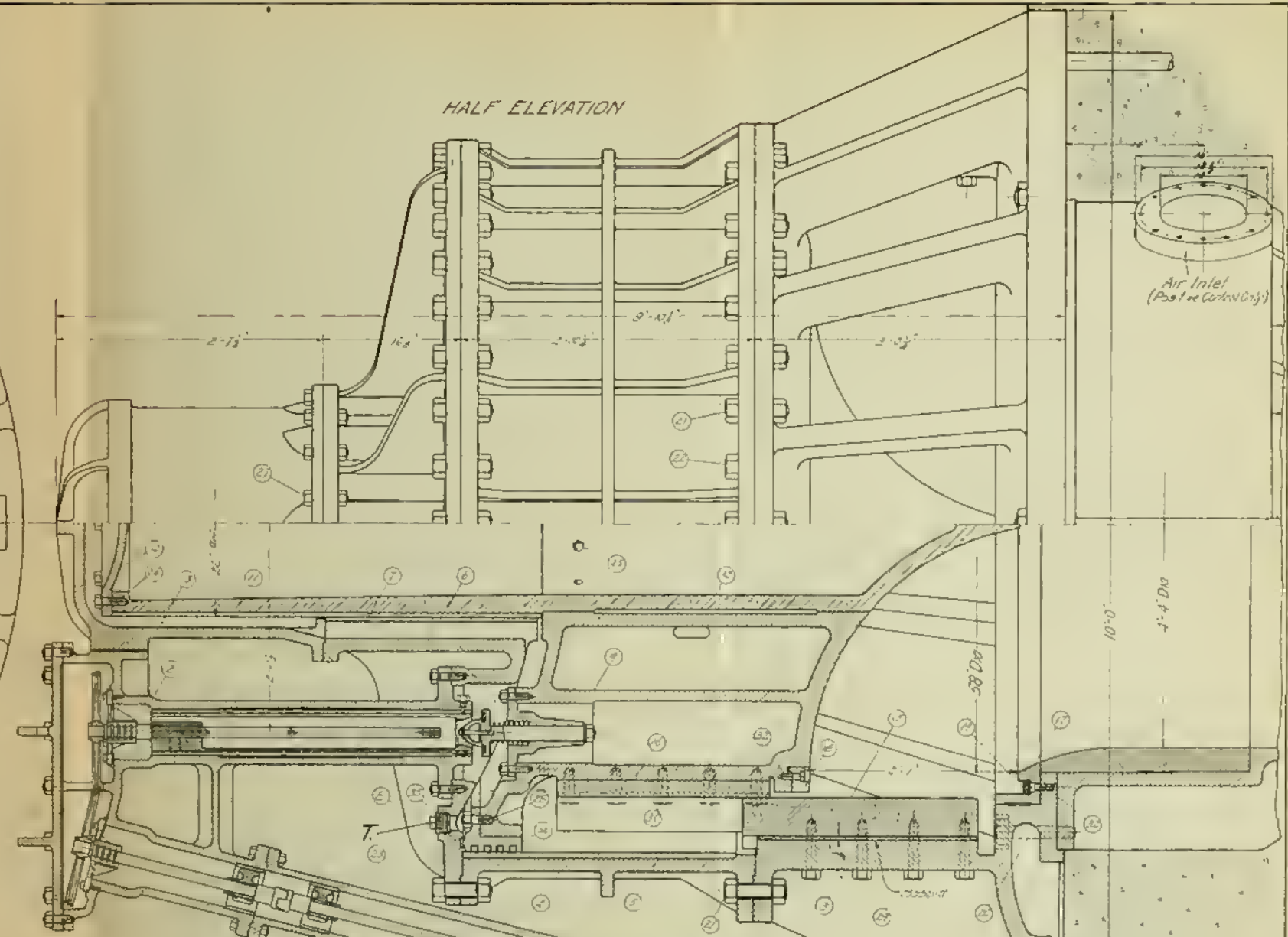
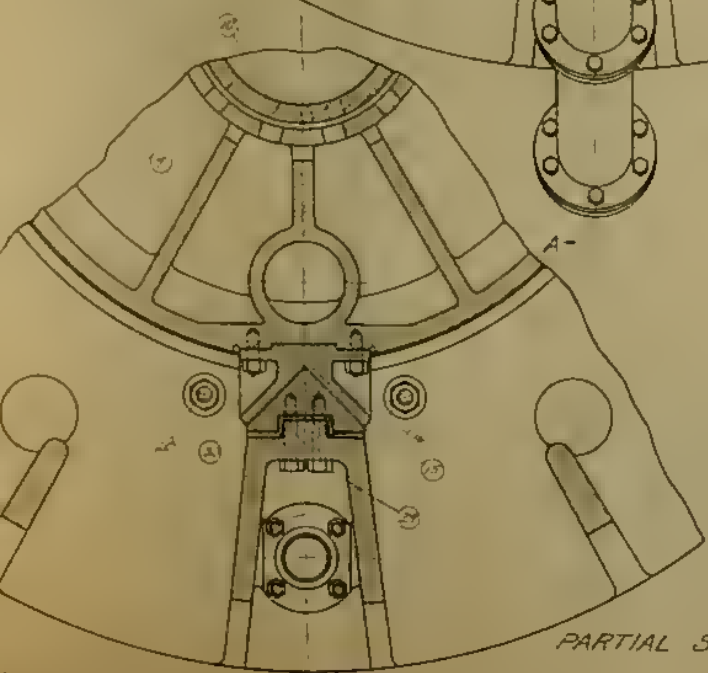
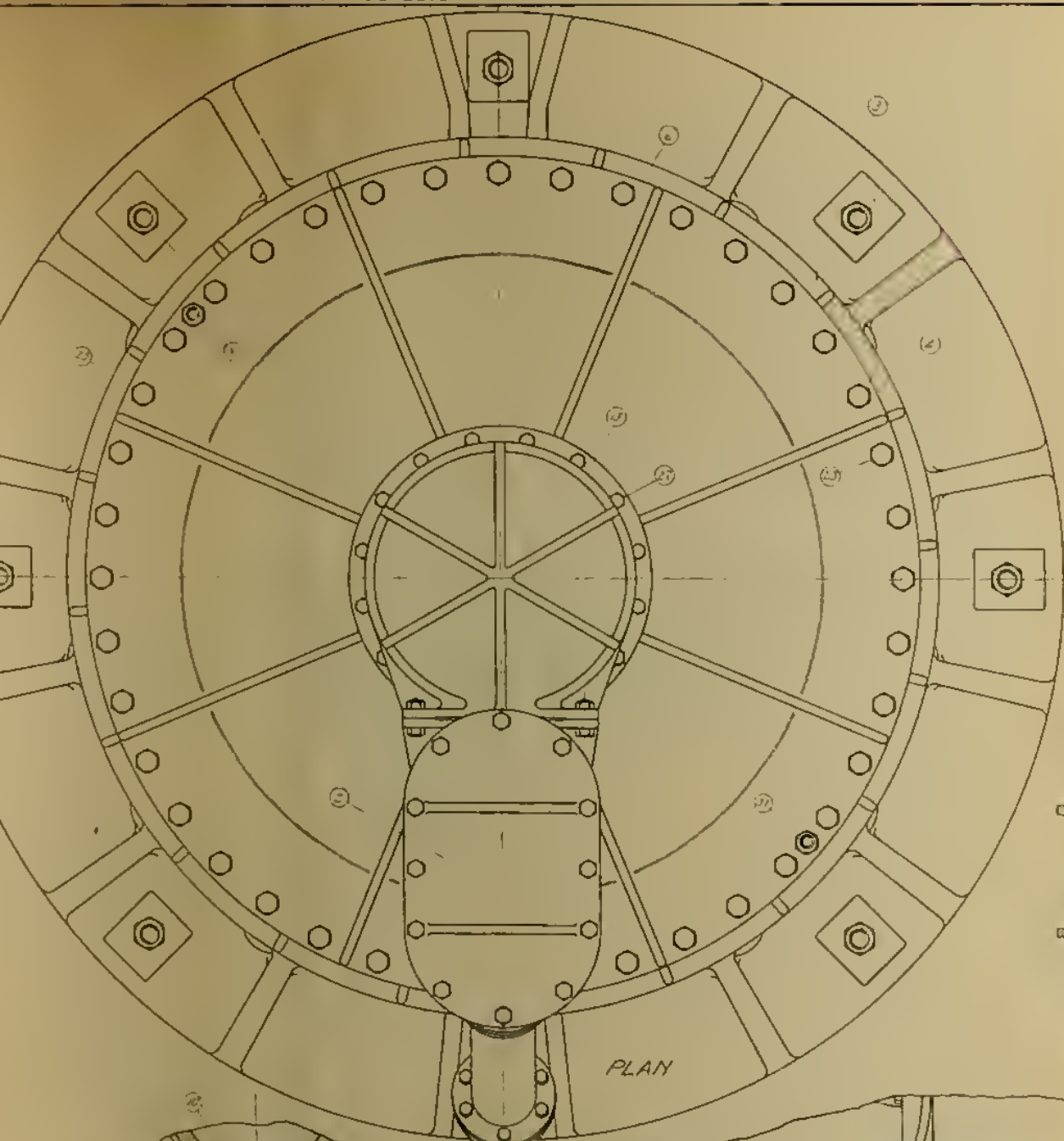
BILL OF MATERIAL FOR ONE GATE			
No.	QTY.	DESCRIPTION	REMARKS
1	1	Gate Body	SLUICE GATE
2	1	Gate Frame	SLUICE GATE
3	1	Gate Operation Mechanism	SLUICE GATE
4	1	Gate Seal	SLUICE GATE
5	1	Gate Hinge	SLUICE GATE
6	1	Gate Lock	SLUICE GATE
7	1	Gate Guide	SLUICE GATE
8	1	Gate Support	SLUICE GATE
9	1	Gate Foundation	SLUICE GATE
10	1	Gate Foundation	SLUICE GATE
11	1	Gate Foundation	SLUICE GATE
12	1	Gate Foundation	SLUICE GATE
13	1	Gate Foundation	SLUICE GATE
14	1	Gate Foundation	SLUICE GATE
15	1	Gate Foundation	SLUICE GATE
16	1	Gate Foundation	SLUICE GATE
17	1	Gate Foundation	SLUICE GATE
18	1	Gate Foundation	SLUICE GATE
19	1	Gate Foundation	SLUICE GATE
20	1	Gate Foundation	SLUICE GATE
21	1	Gate Foundation	SLUICE GATE
22	1	Gate Foundation	SLUICE GATE
23	1	Gate Foundation	SLUICE GATE
24	1	Gate Foundation	SLUICE GATE
25	1	Gate Foundation	SLUICE GATE

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BOISE IRRIGATION PROJECT, IDAHO
ARROWROCK DAM
HIGH PRESSURE GATES, 5 X 5 FEET
NO 20367 PLATE 47 OF 88
1923



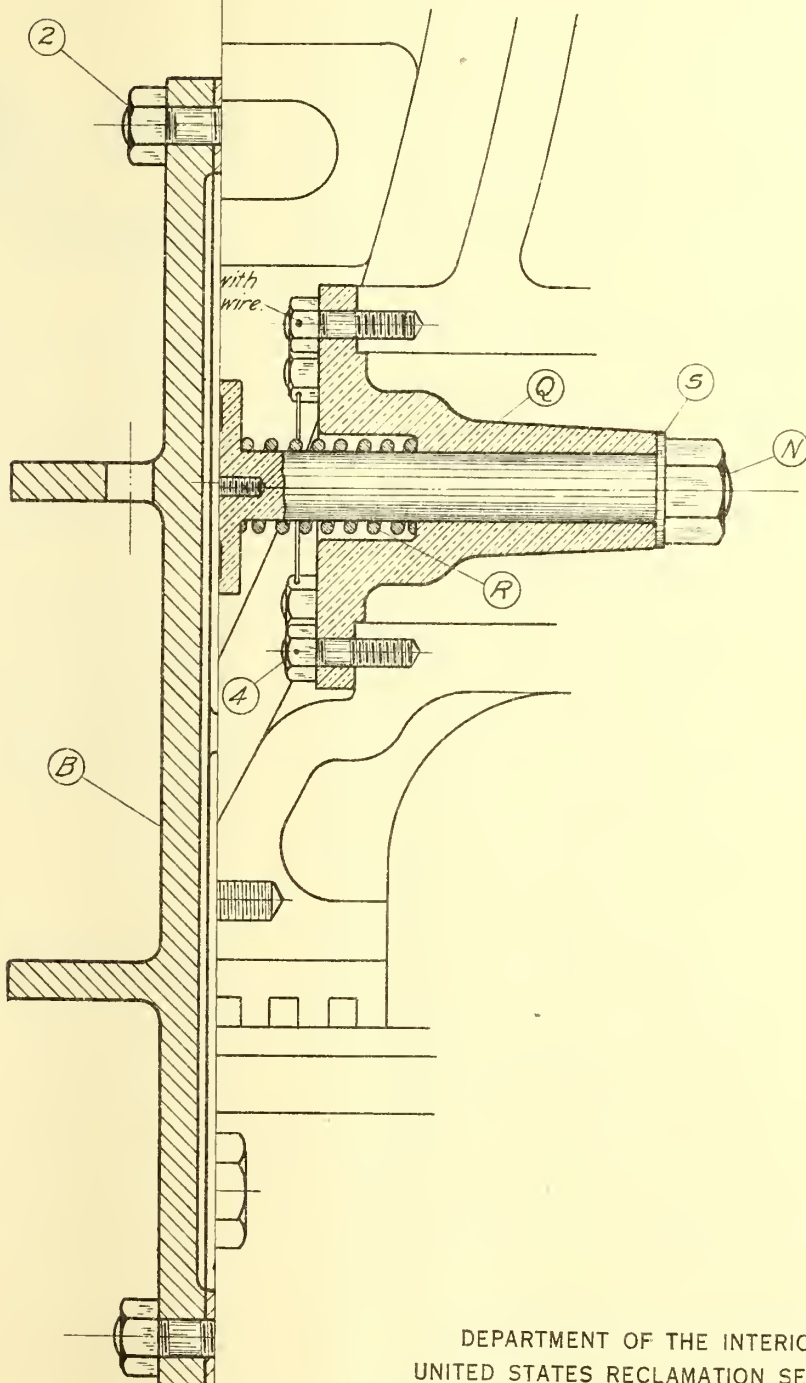
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BOISE IRRIGATION PROJECT, IDAHO
ARROWROCK DAM
BALANCED VALVE, 58 INCH DIAMETER

NO. 20388 PLATE 48 OF 88
1923



SCALE

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BOISE IRRIGATION PROJECT, IDAHO
ARROWROCK DAM
BALANCED VALVE, 58 INCH DIAMETER
NO 20388 PLATE 4B OF 88
1923



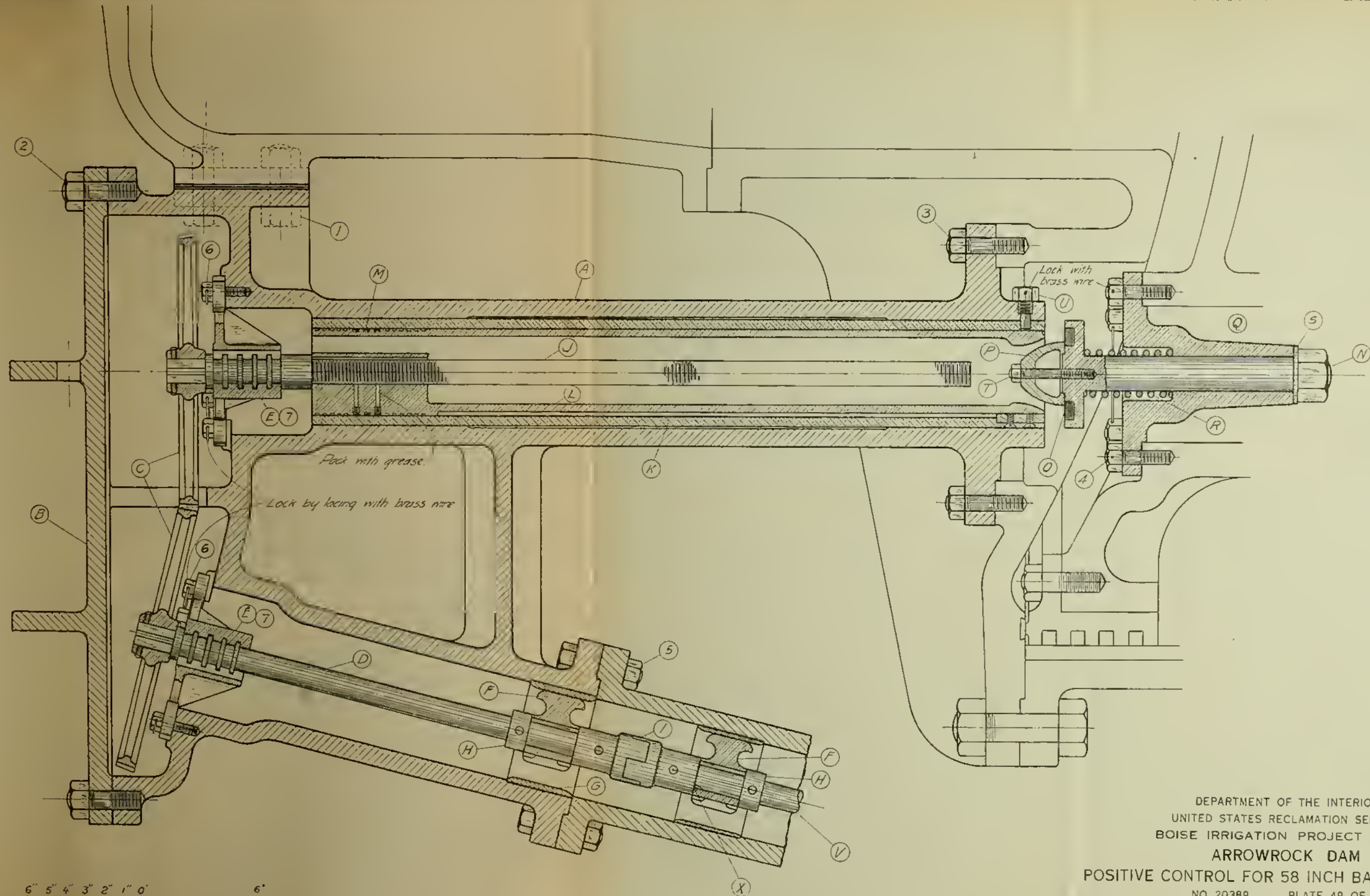
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BOISE IRRIGATION PROJECT IDAHO
ARROWROCK DAM
POSITIVE CONTROL FOR 58 INCH BALANCED VALVE

NO. 20389

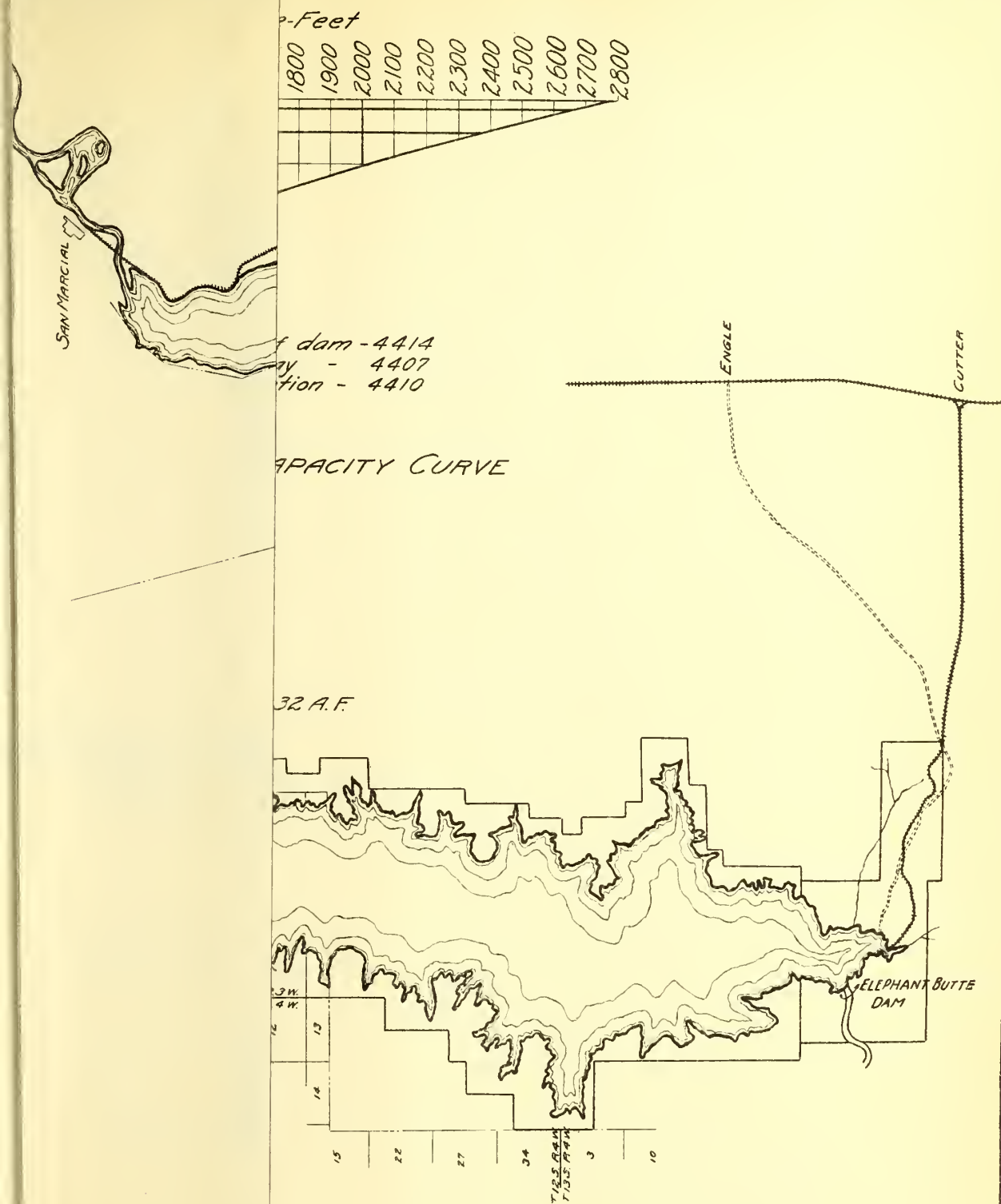
PLATE 49 OF 88

1923

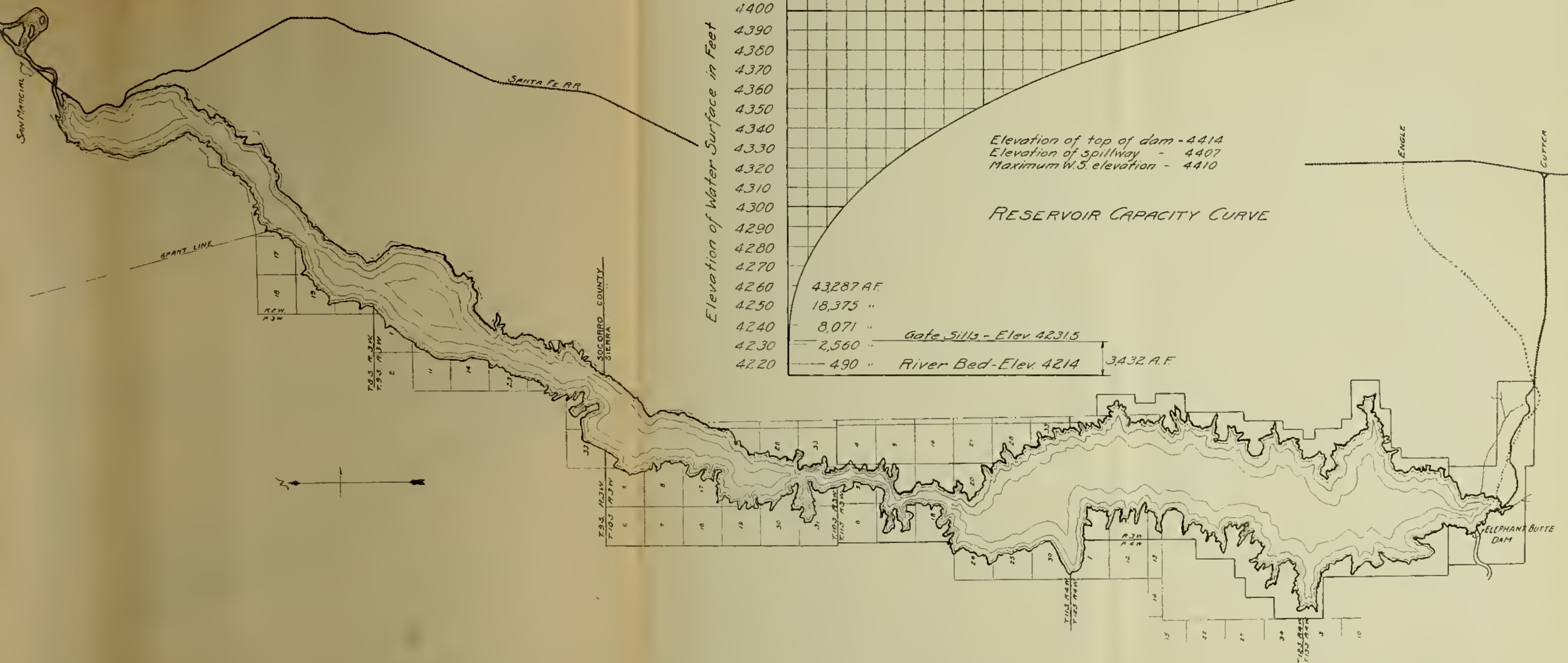
4-E-30



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
BOISE IRRIGATION PROJECT IDAHO
ARROWROCK DAM
POSITIVE CONTROL FOR 58 INCH BALANCED VALVE
NO. 20389 PLATE 49 OF 88
1923



DEPARTMENT OF THE INTERIOR
 UNITED STATES RECLAMATION SERVICE
 RIO GRANDE IRRIGATION PROJECT, NEW MEXICO-TEXAS
ELEPHANT BUTTE RESERVOIR
MAP AND CAPACITY CURVE
 NO. 20390 PLATE 50 OF 88
 1923



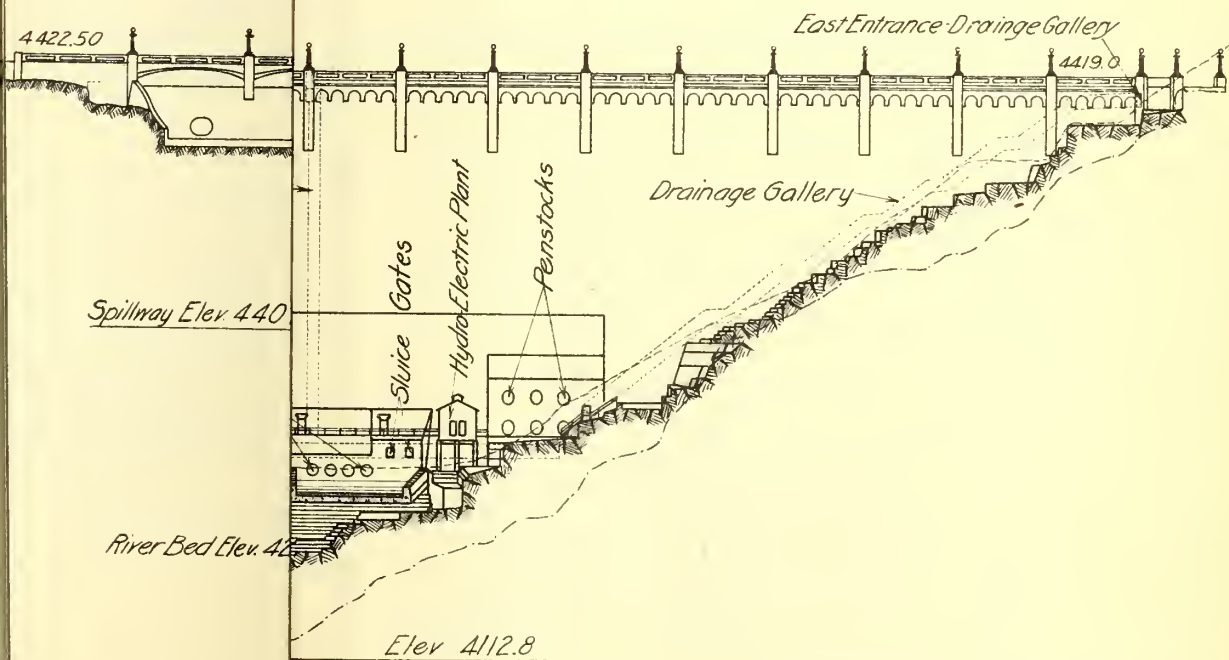
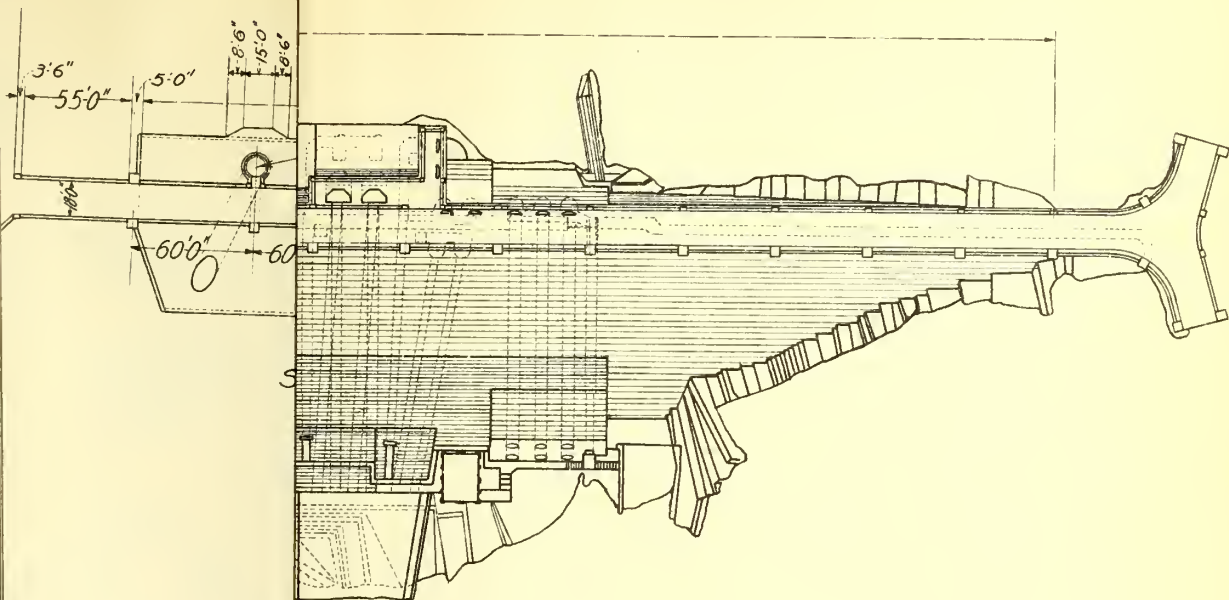
DEPARTMENT OF THE INTERIOR
 UNITED STATES RECLAMATION SERVICE
 RIO GRANDE IRRIGATION PROJECT, NEW MEXICO-TEXAS

**ELEPHANT BUTTE RESERVOIR
 MAP AND CAPACITY CURVE**

NO 20390 PLATE 50 OF 88

1923

24-E-62



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
RIO GRANDE IRRIGATION PROJECT
NEW MEXICO - TEXAS

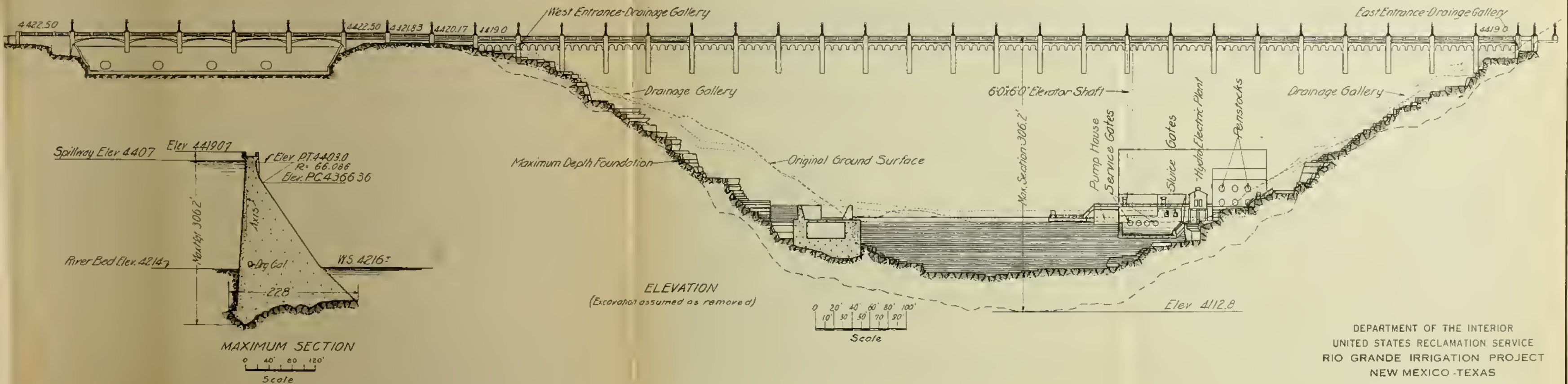
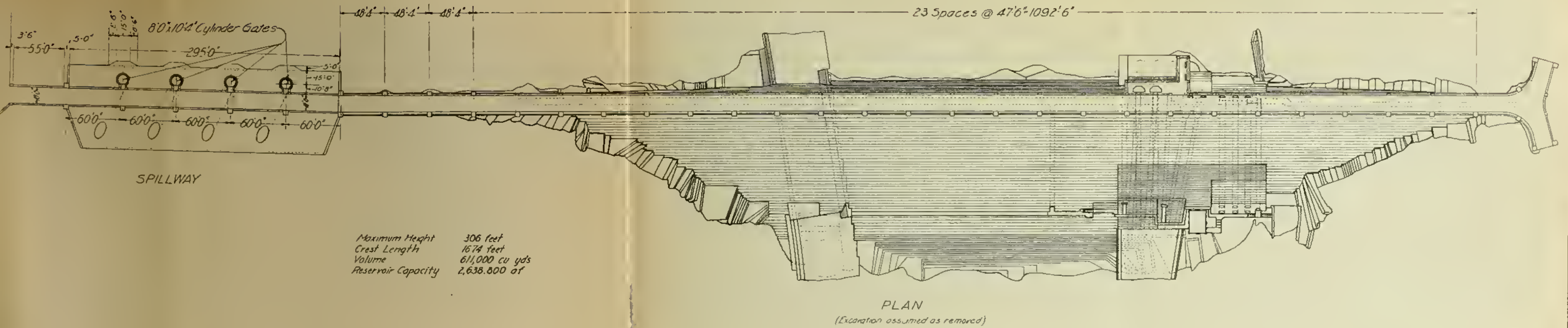
ELEPHANT BUTTE DAM PLAN AND ELEVATION

NO. 20391

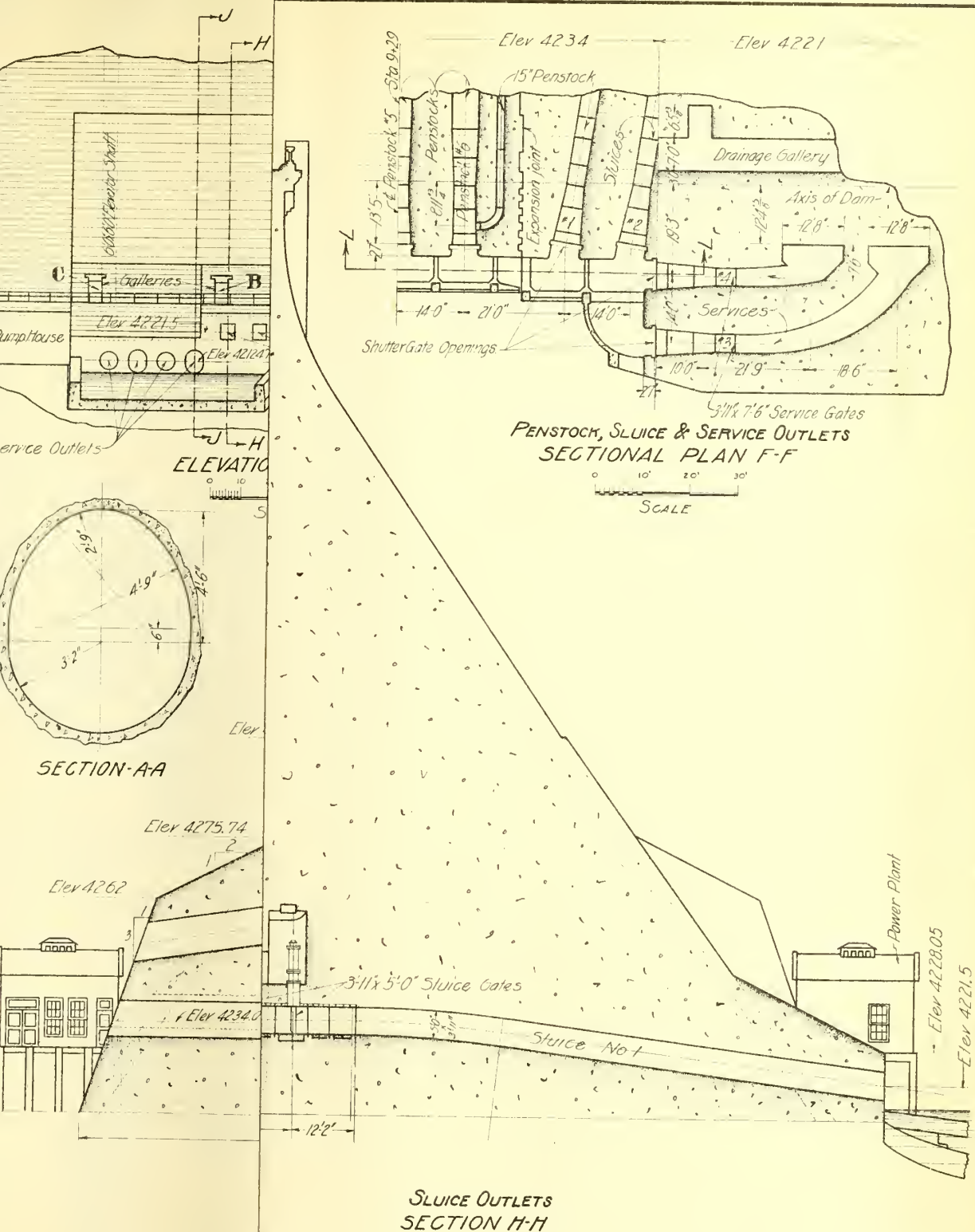
PLATE 51 OF 88

1923

24-E-55



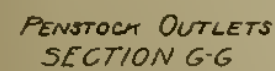
DEPARTMENT OF THE INTERIOR
 UNITED STATES RECLAMATION SERVICE
 RIO GRANDE IRRIGATION PROJECT
 NEW MEXICO - TEXAS
 ELEPHANT BUTTE DAM
 PLAN AND ELEVATION
 NO 20391 PLATE 51 OF 88
 1923



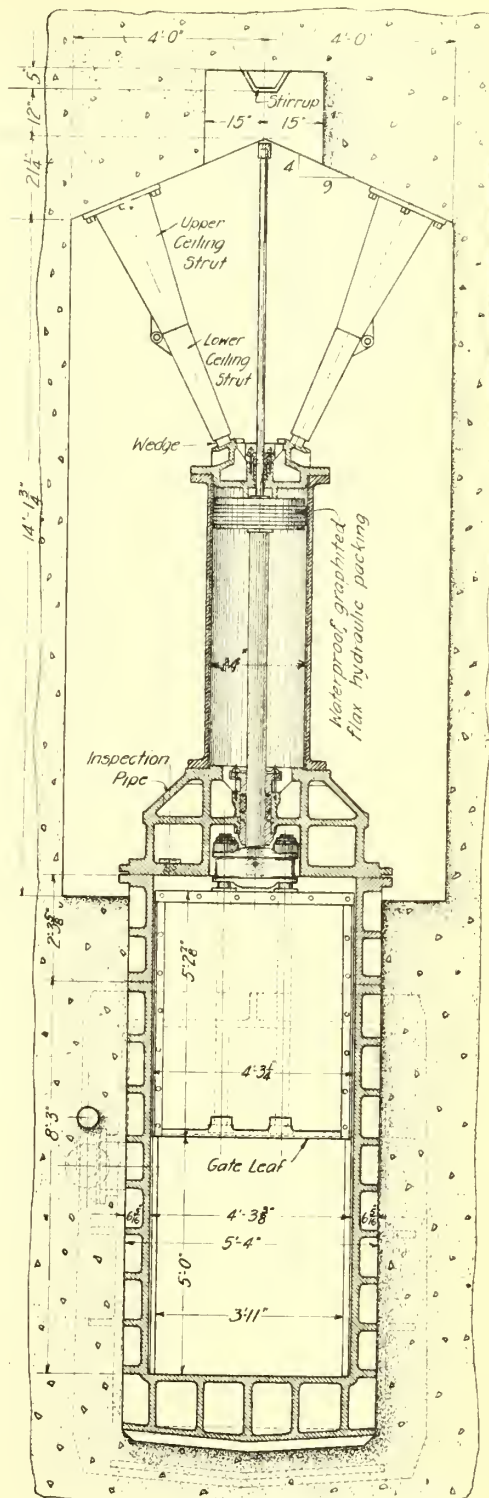
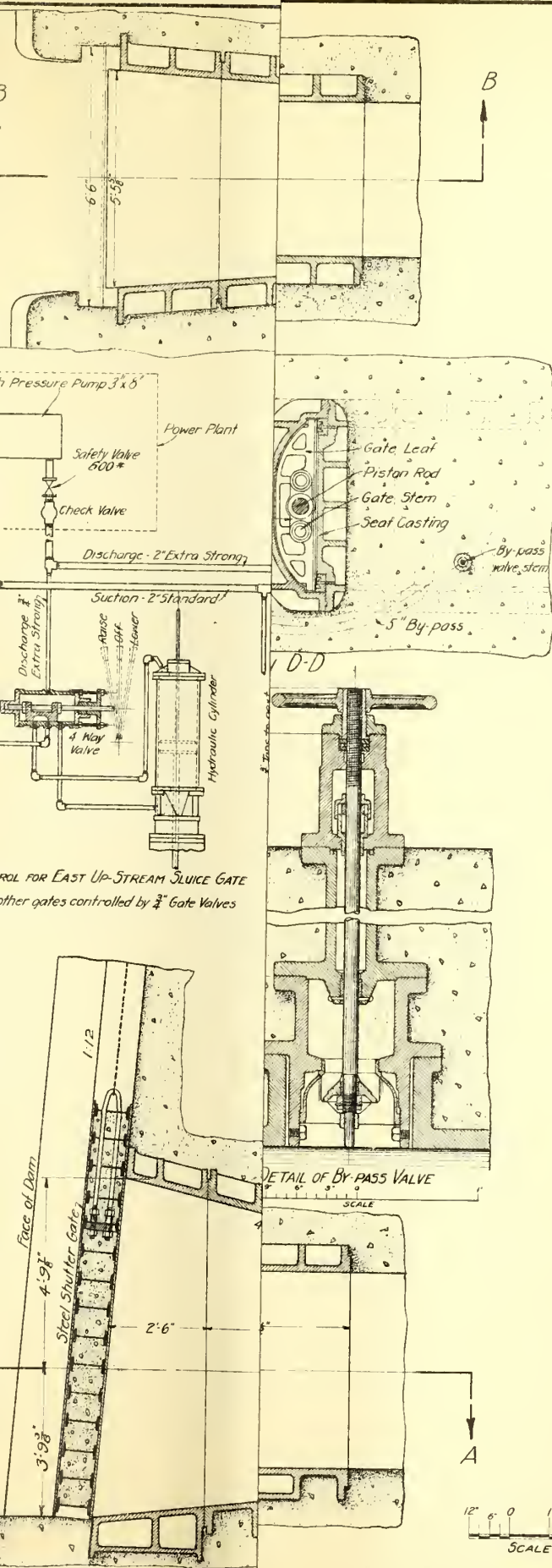
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
RIO GRANDE IRRIGATION PROJECT
NEW MEXICO-TEXAS
ELEPHANT BUTTE DAM
SLUICE AND PENSTOCK GATES

NO. 20392 PLATE 52 OF 88
1923

24-E-57



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
RIO GRANDE IRRIGATION PROJECT
NEW MEXICO-TEXAS
ELEPHANT BUTTE DAM
SLUICE AND PENSTOCK GATES
NO. 20392 PLATE 52 OF 88
1923

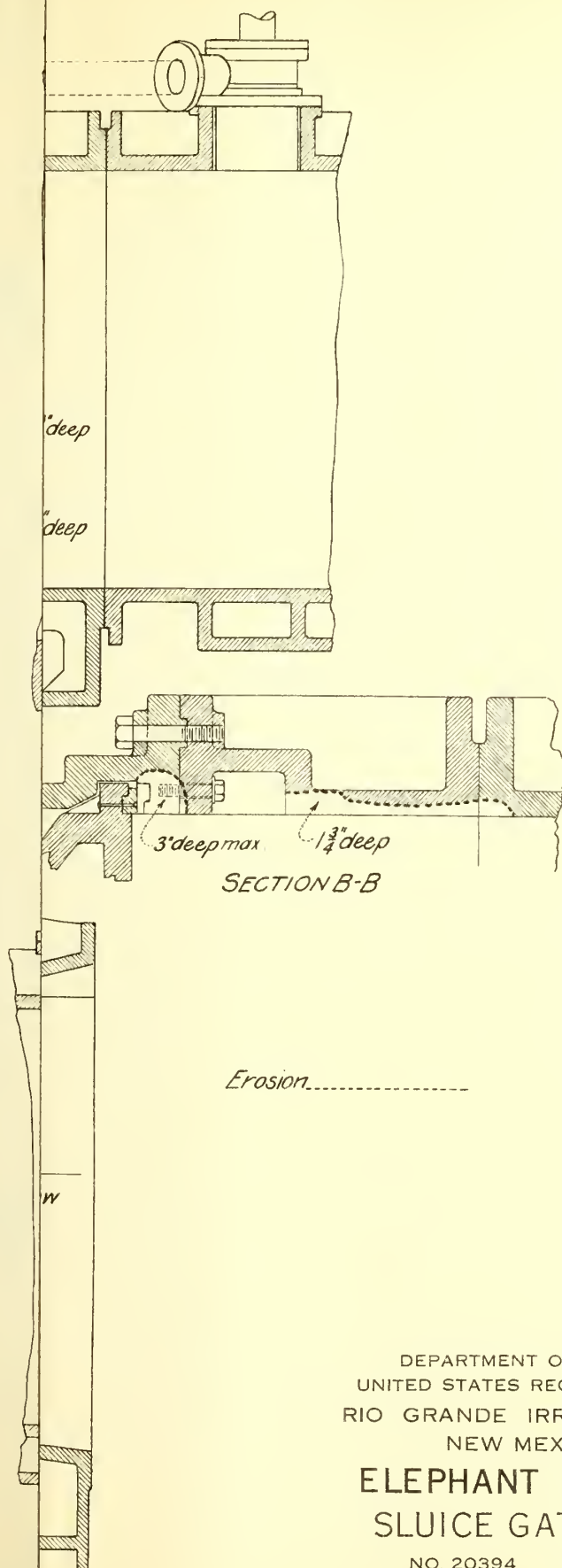


SECTION E-E

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
RIO GRANDE IRRIGATION PROJECT
NEW MEXICO-TEXAS
ELEPHANT BUTTE DAM
SLUICE GATES

NO. 20393 PLATE 53 OF 88
1923

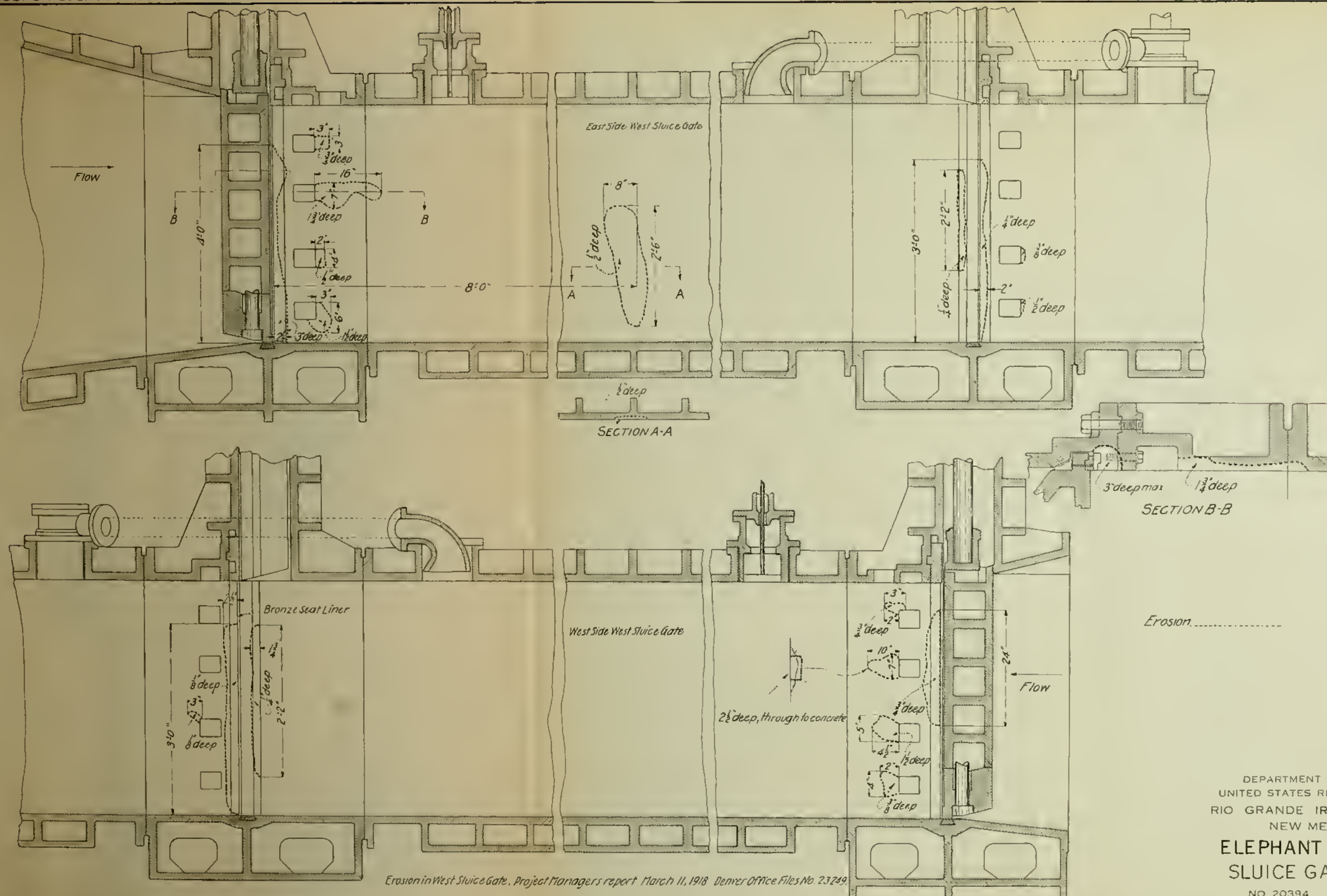




DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
RIO GRANDE IRRIGATION PROJECT
NEW MEXICO-TEXAS

ELEPHANT BUTTE DAM SLUICE GATE EROSION

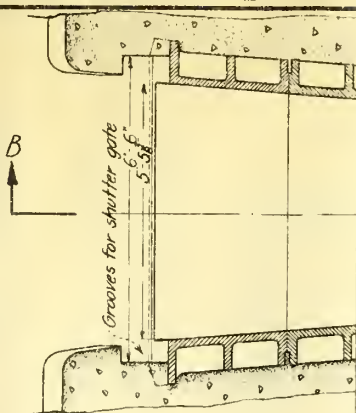
NO. 20394 PLATE 54 OF 88
1923



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
RIO GRANDE IRRIGATION PROJECT
NEW MEXICO-TEXAS
**ELEPHANT BUTTE DAM
SLUICE GATE EROSION**

NO 20394 PLATE 54 OF 88
1923

Note. Erosion occurred in East Sluice Gate very similar to that shown on this drawing for West Sluice Gate



To raise gate, close valves B & C,
and open valves A & D
To lower gate, close valves A & D
and open valves B & C.

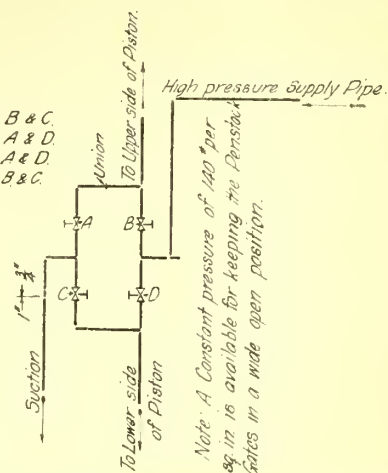
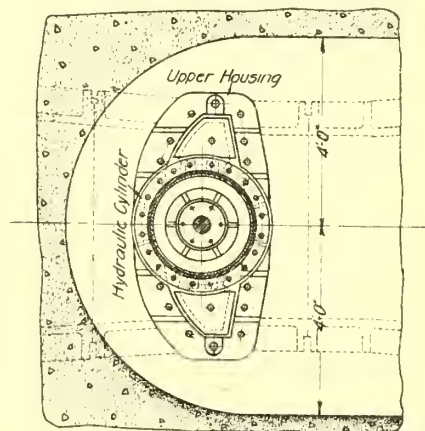
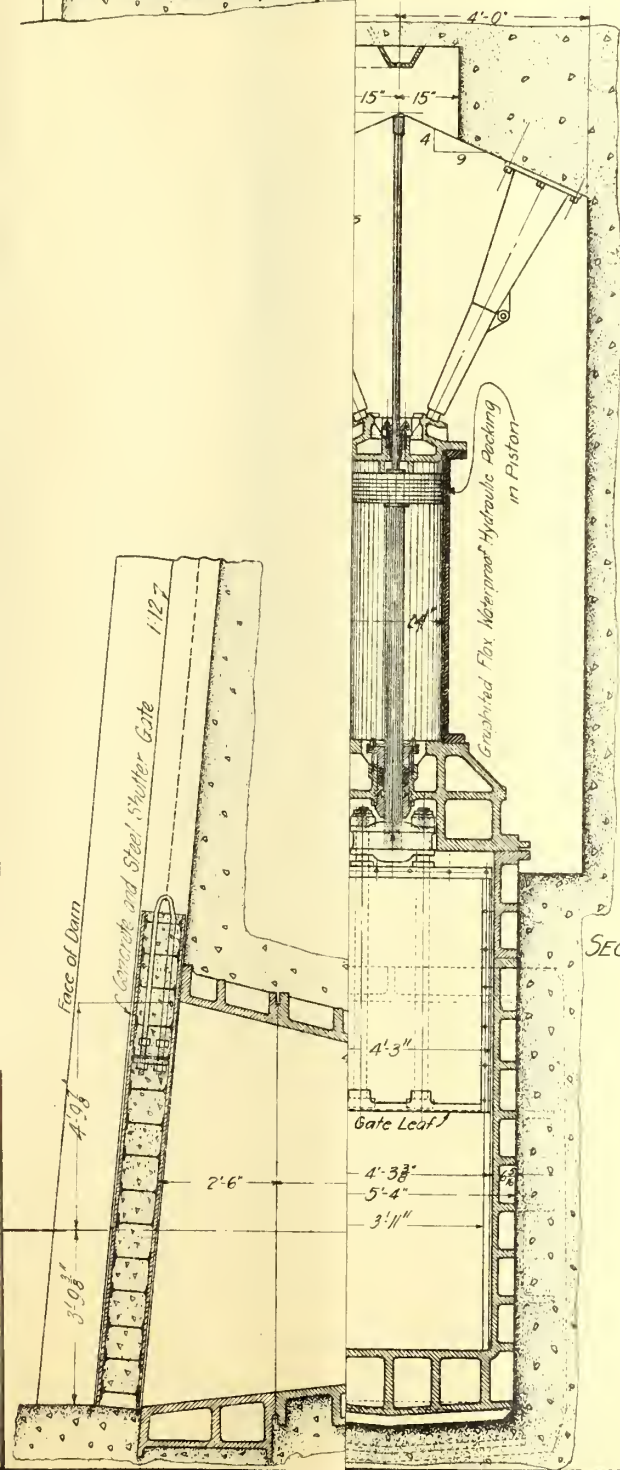


DIAGRAM OF PIPES FOR OPERATING CYLINDER



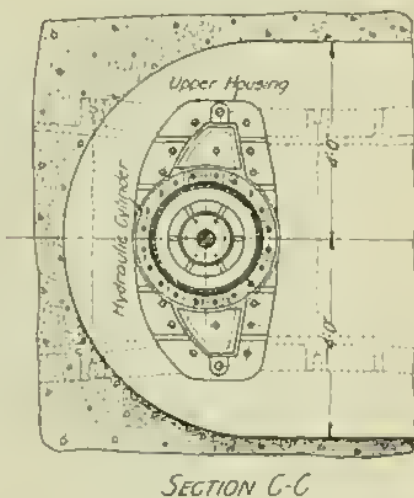
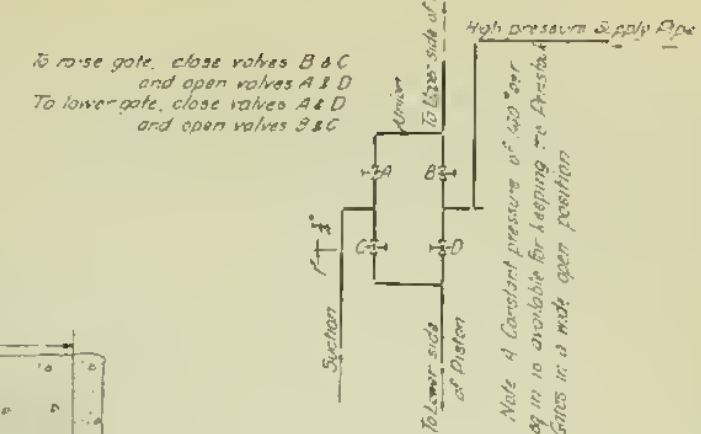
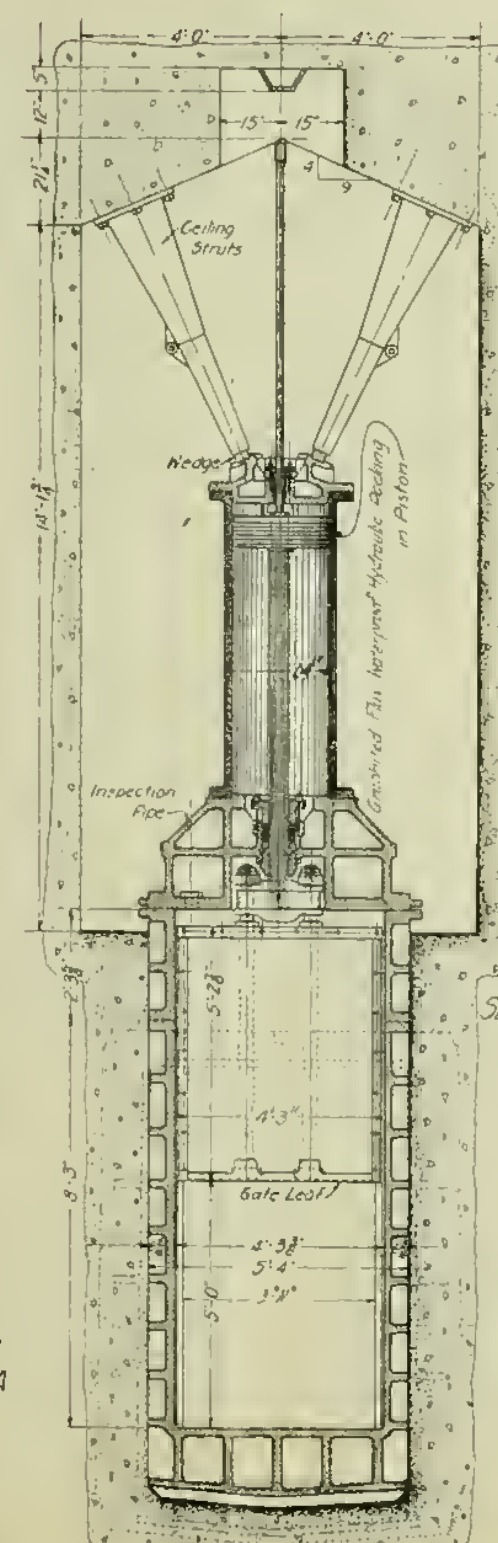
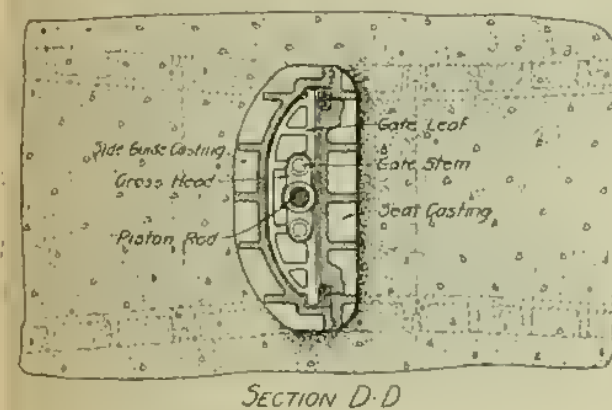
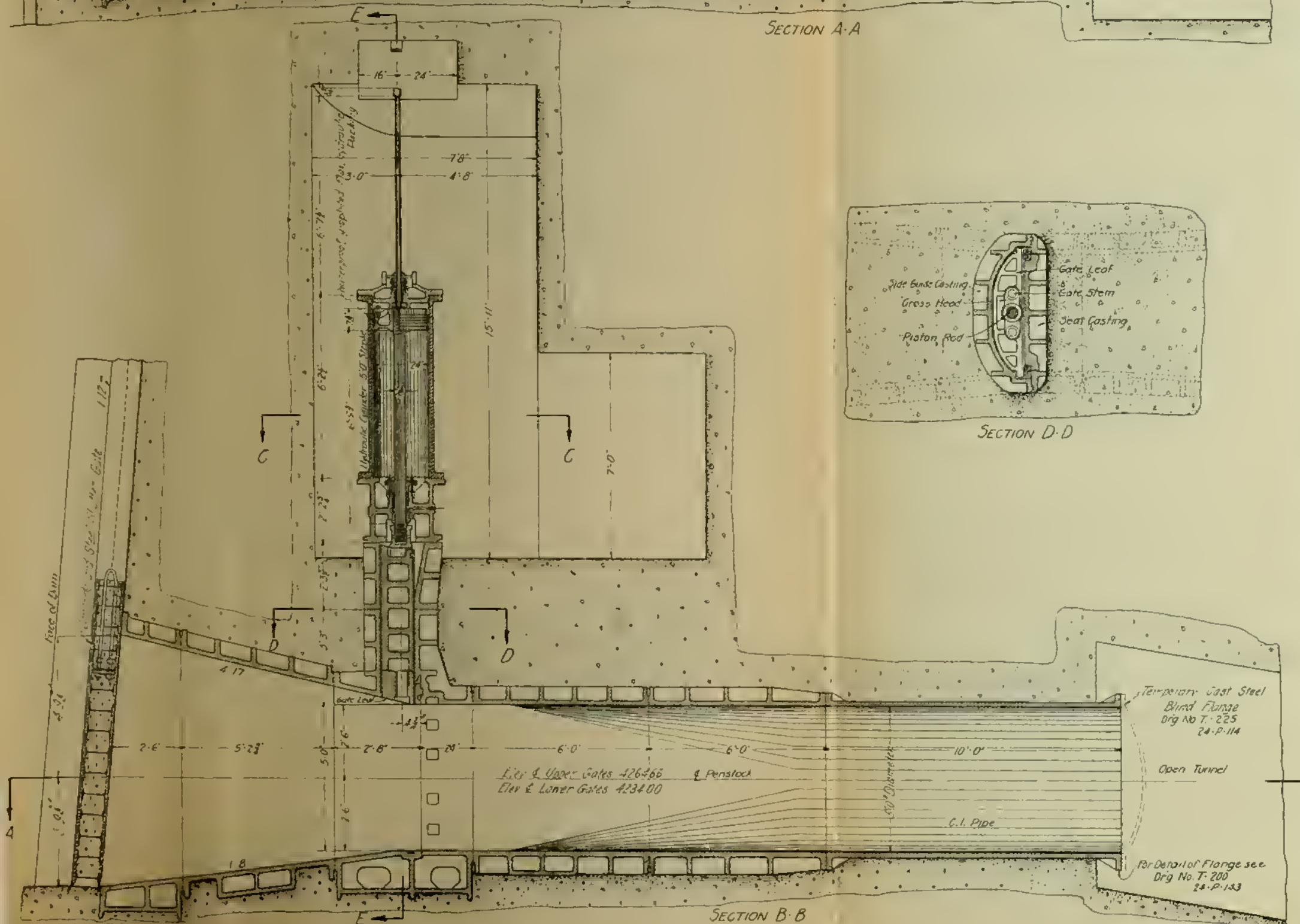
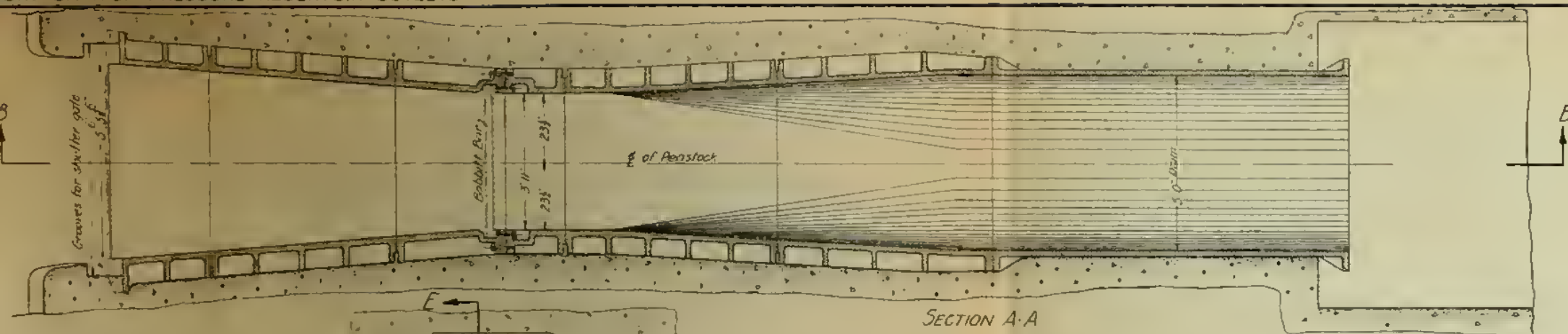
SECTION C-C



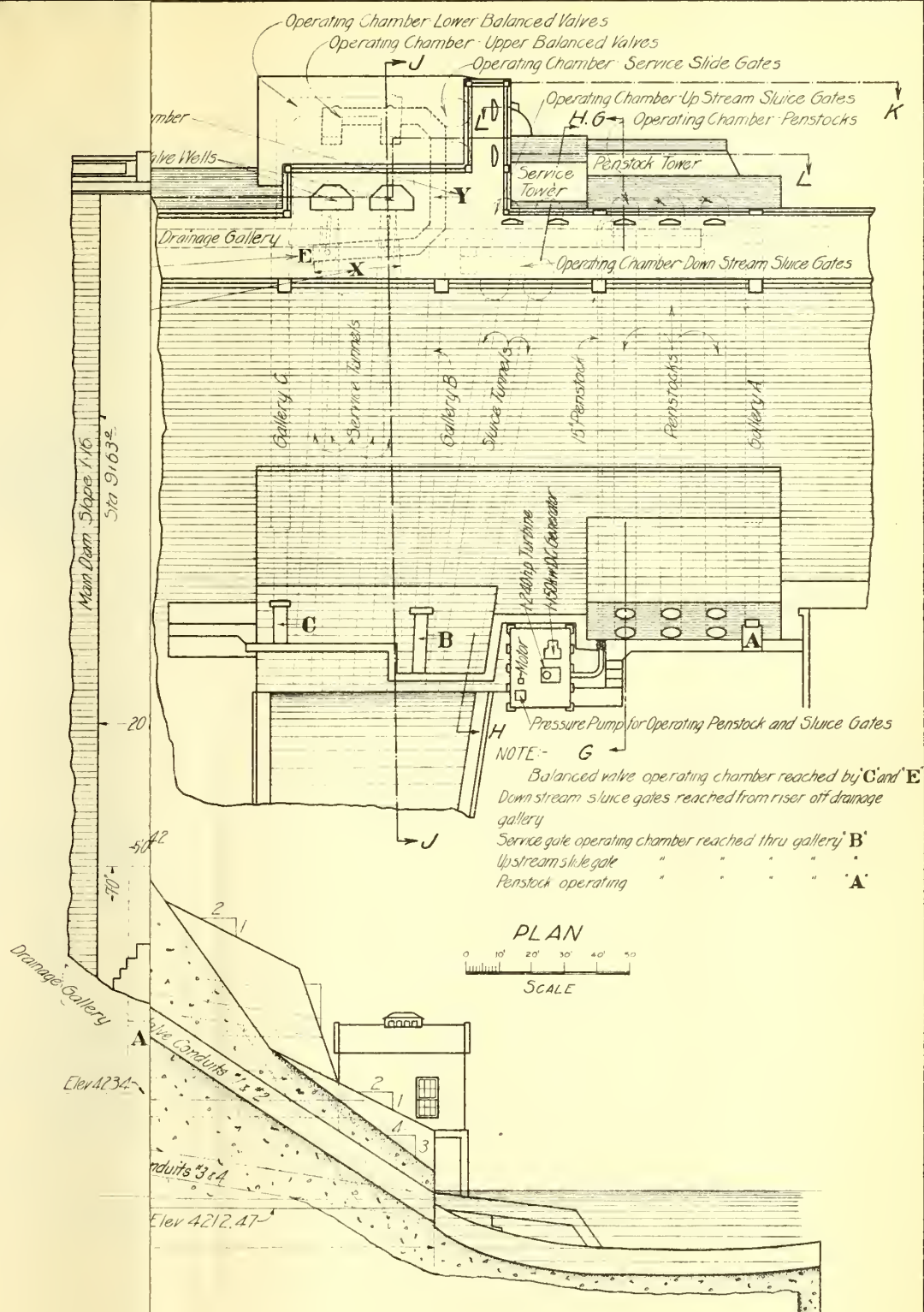
SECTION E-E



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
RIO GRANDE IRRIGATION PROJECT
NEW MEXICO-TEXAS
ELEPHANT BUTTE DAM
PENSTOCK GATES
NO. 20395 PLATE 55 OF 88
1923



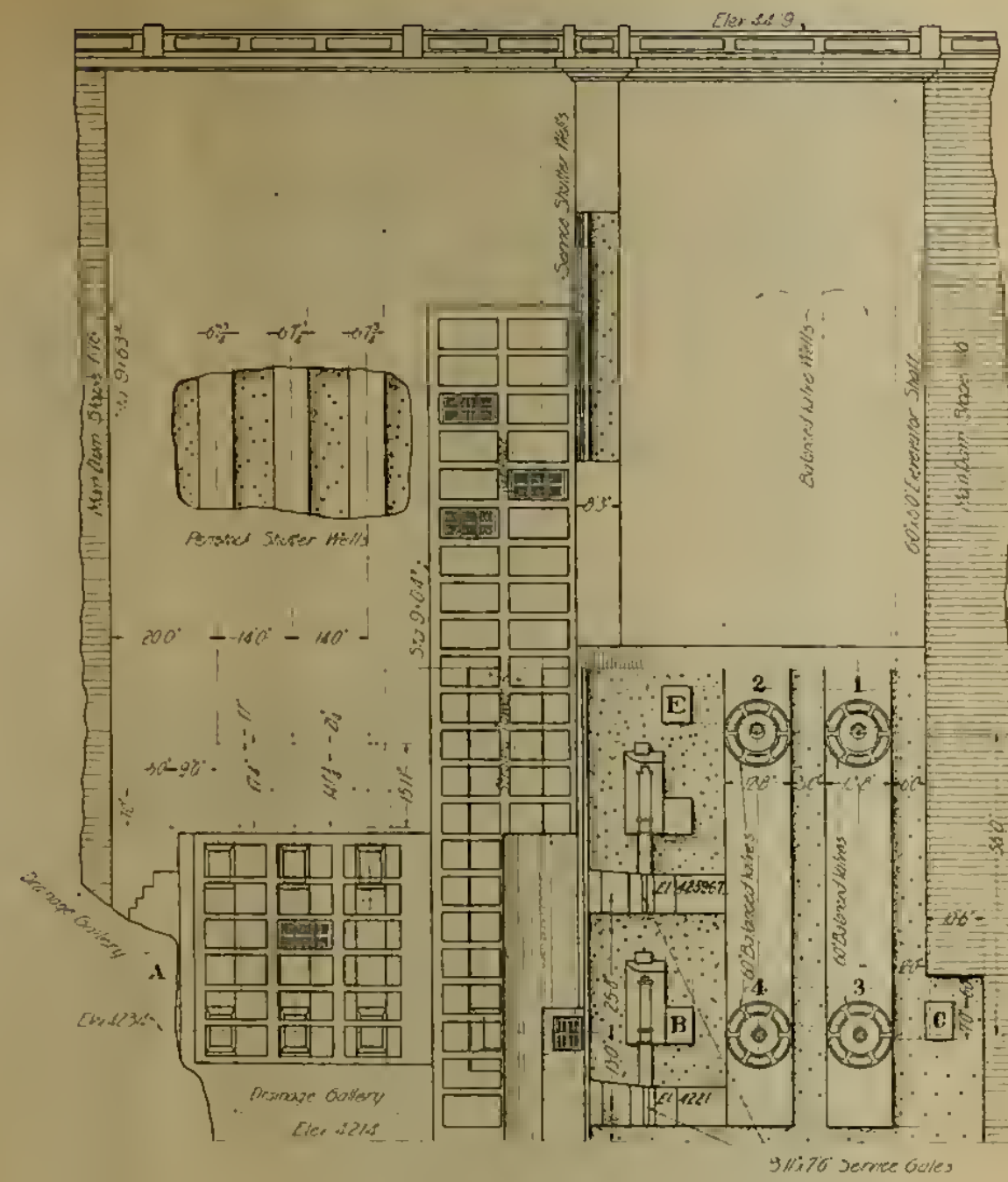
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
RIO GRANDE IRRIGATION PROJECT
NEW MEXICO-Texas
ELEPHANT BUTTE DAM
PENSTOCK GATES
NO. 20395 PLATE 55 OF 68
1923



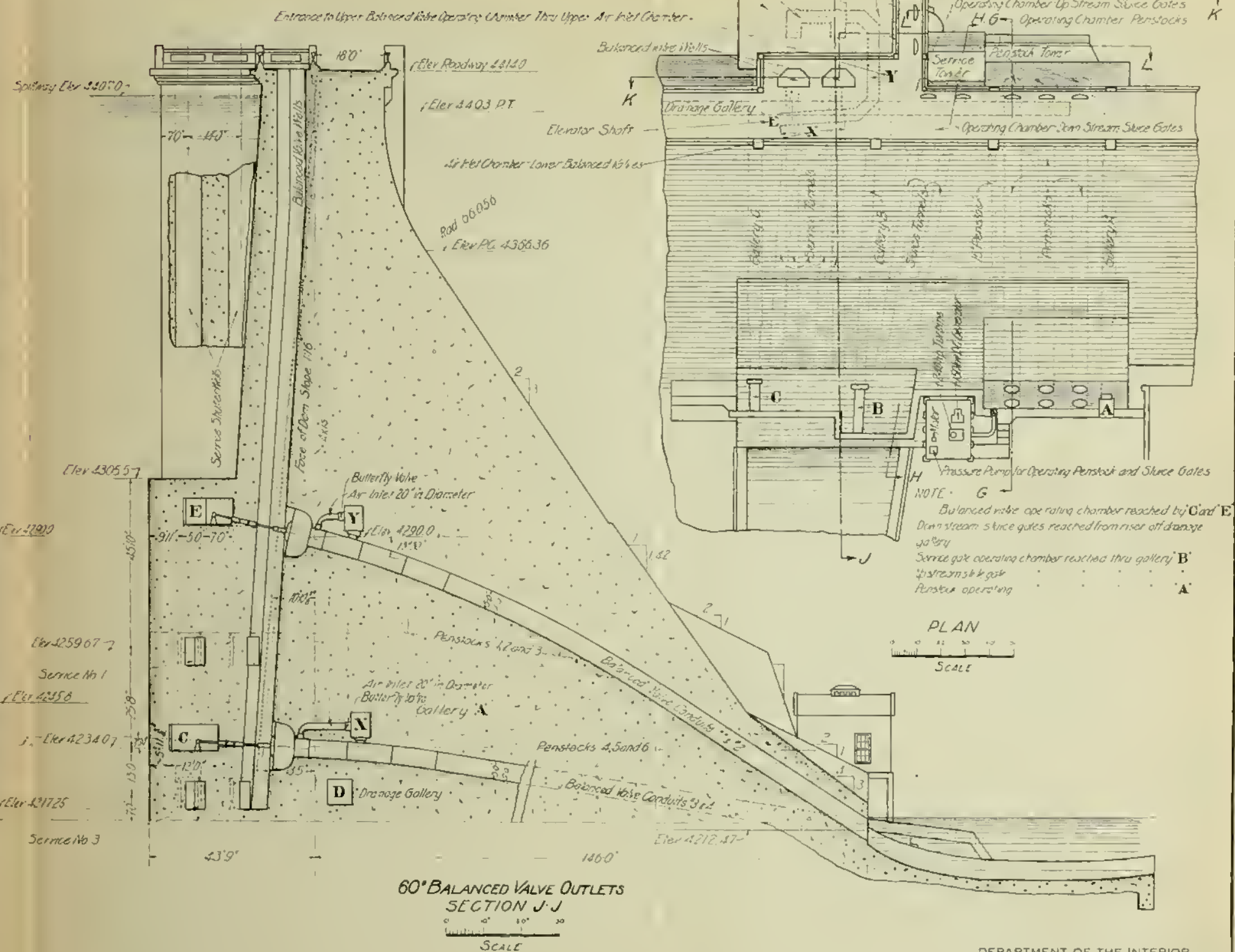
DEPARTMENT OF THE INTERIOR
 UNITED STATES RECLAMATION SERVICE
 RIO GRANDE IRRIGATION PROJECT
 NEW MEXICO-TEXAS
ELEPHANT BUTTE DAM
SERVICE OUTLETS

NO 20396 PLATE 56 OF 88
 1923

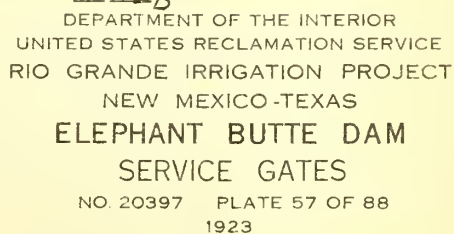
24-E-56

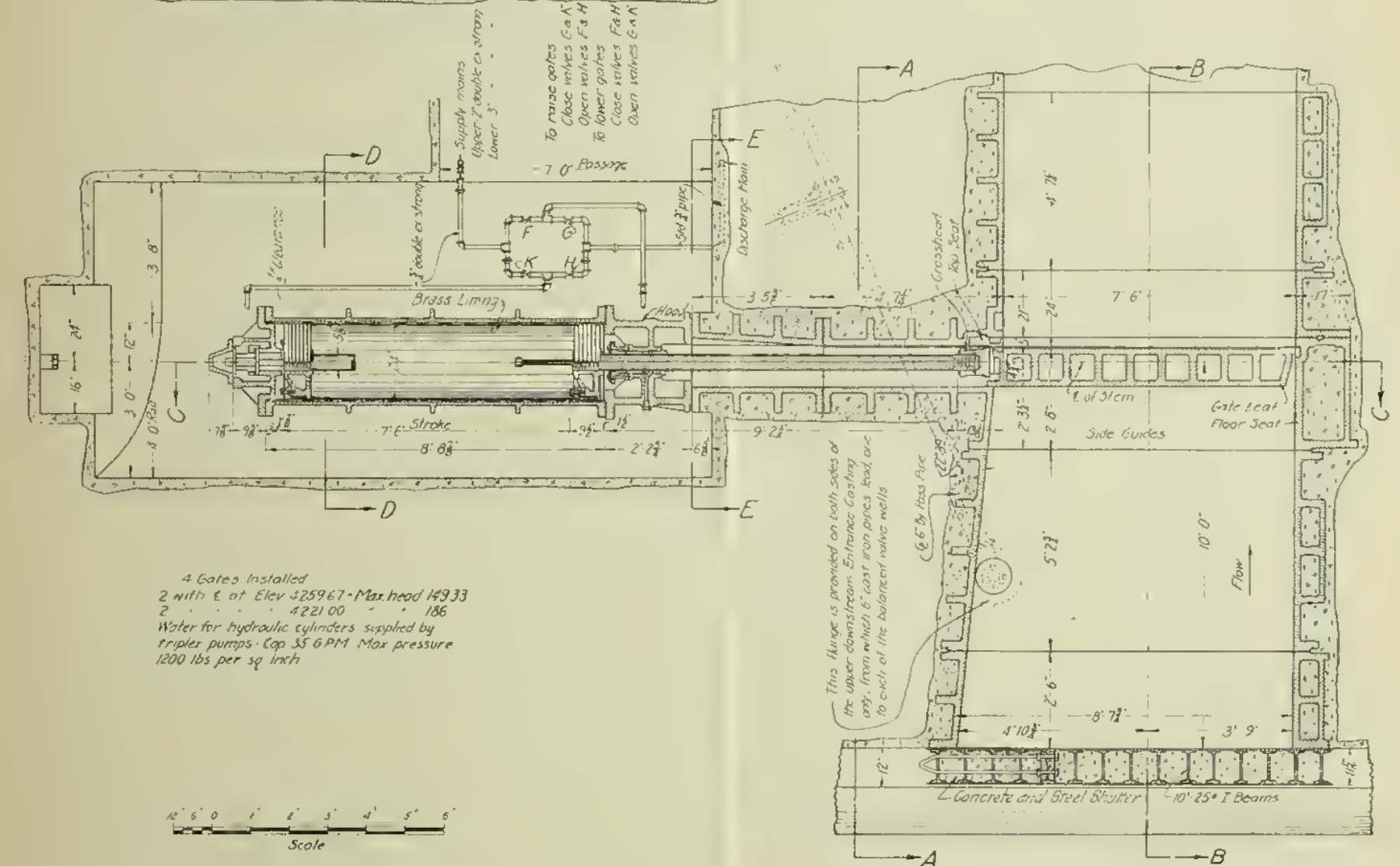
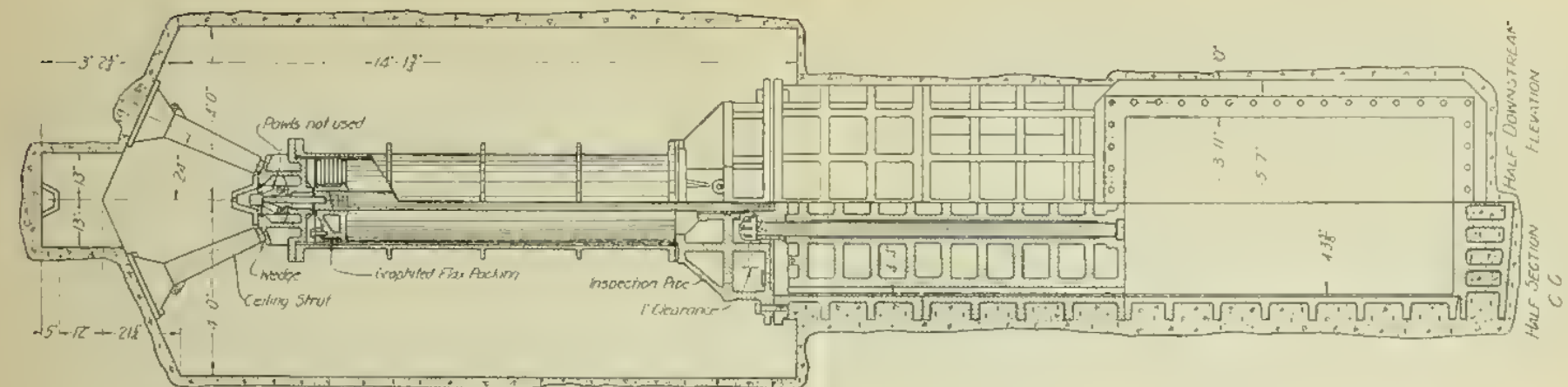
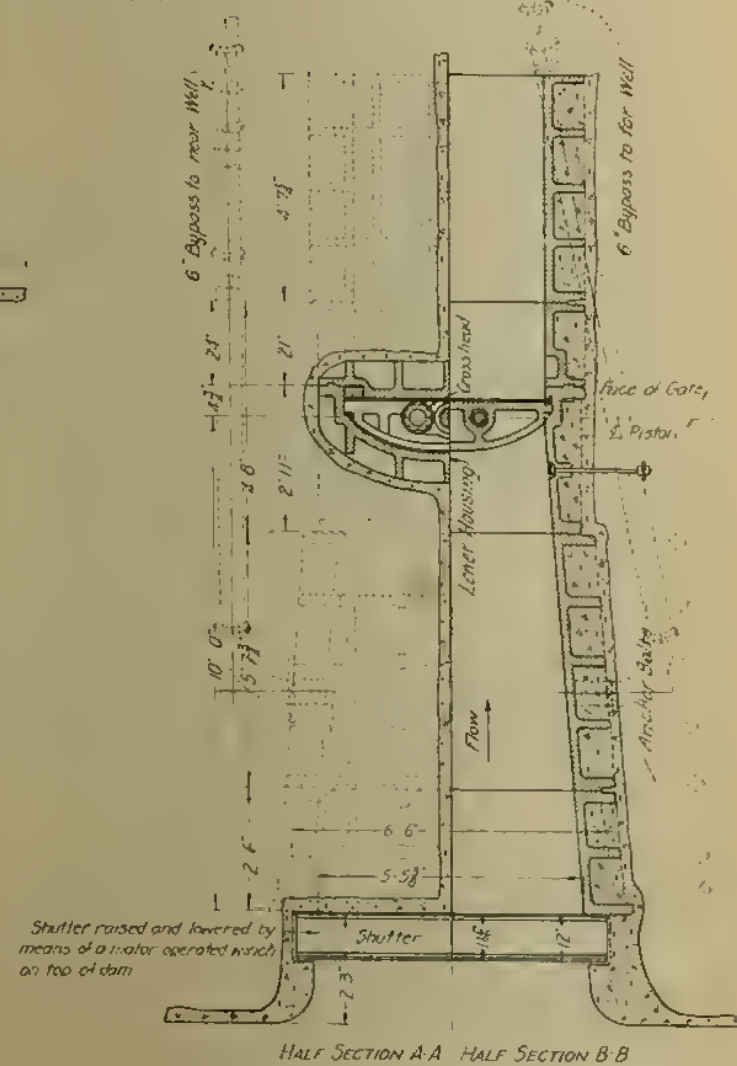
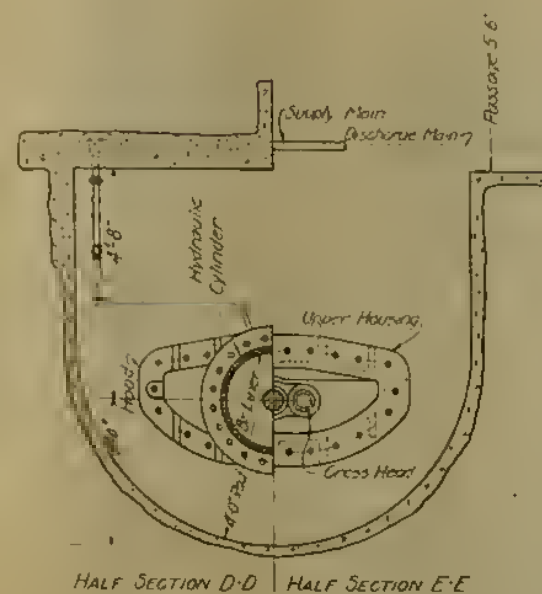
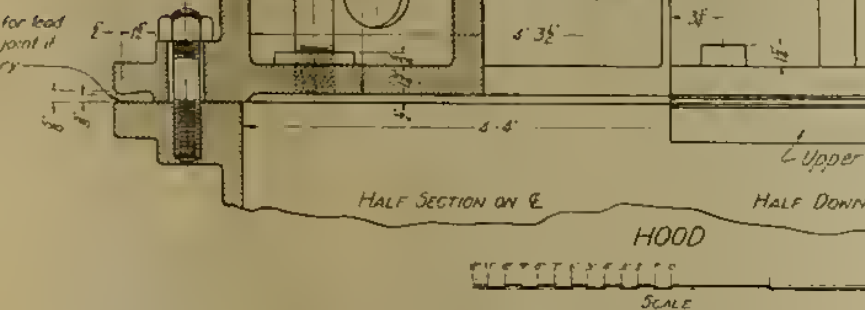


SECTIONAL ELEVATION K-K
SCALE



60° BALANCED VALVE OUTLETS
SECTION J-J
SCALE





4 Gates installed
2 with E. of Elev #25967 - Max head 14933
2 " " " " 422100 " " 186
Water for hydraulic cylinders supplied by
triplex pumps - Cap 35 GPM Max pressure
1200 lbs per sq inch

OPERATION OF BALANCED VALVES connected to Reservoir

Balanced Valve: Assume all valves closed valves A and Y

valve X, applying reservoir pressure under valve Flap, closing it.

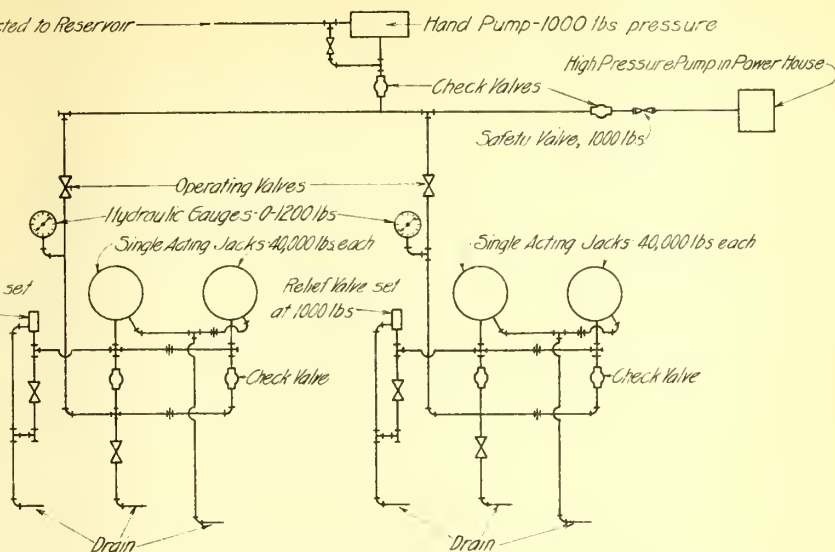
valve S. Fill draft header, air vent on air-venter being open. When draft header is full, close air vent.

Valves S, R, X, and A. Draft tube action becomes effective, producing vacuum back of piston. If piston does not move under the above conditions proceed as follows, using the 2 cylinder hydraulic jack, close all valves but valve Z. Tighten clamp.

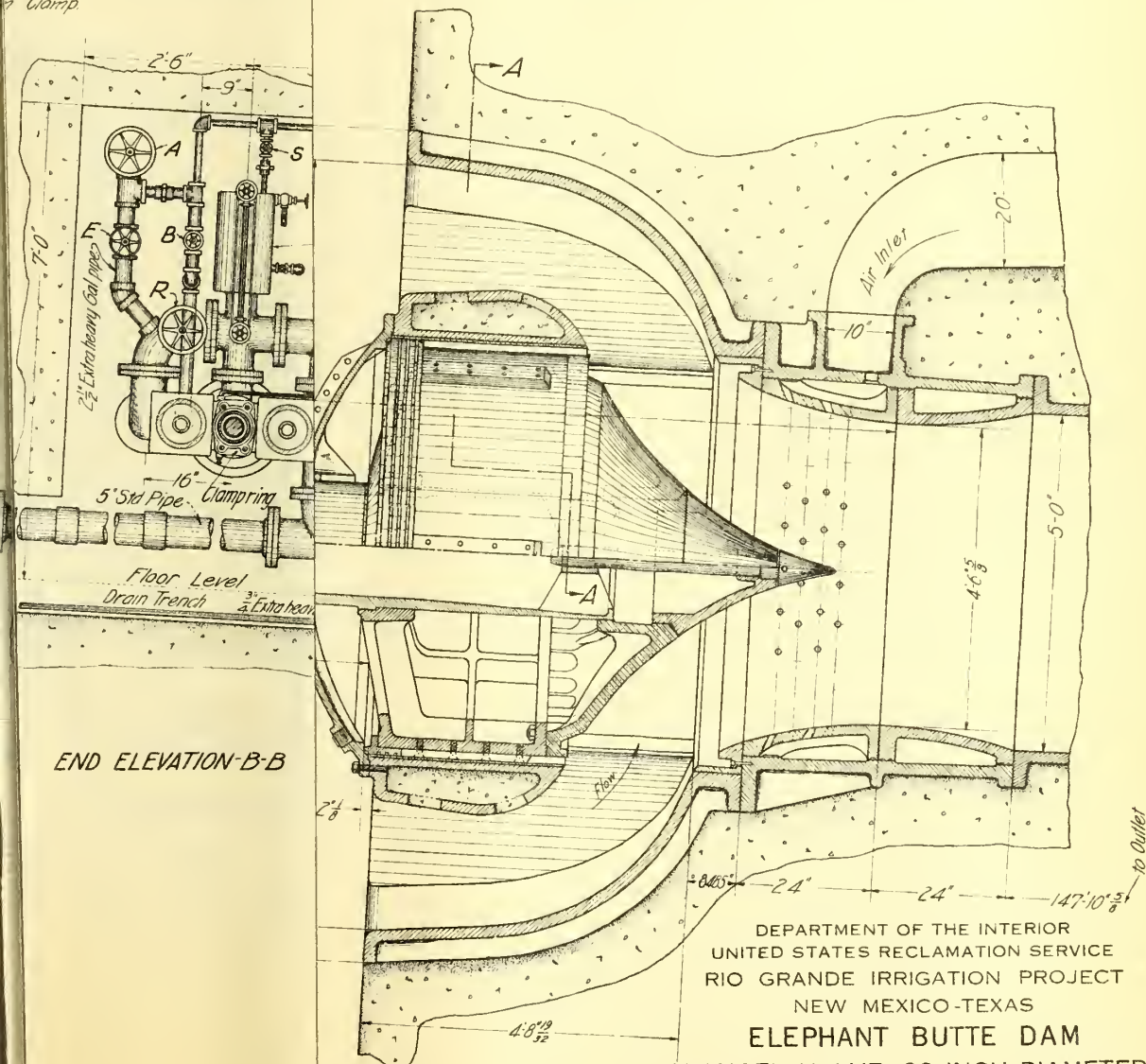
valve Z. Open valve A. Close valve R. valve E slowly, applying reservoir pressure back of the piston until the balanced valve is closed.

Valve E. Close Valve A.

valve Z. Tighten clamp.



PIPING DIAGRAM-AUXILIARY CONTROL



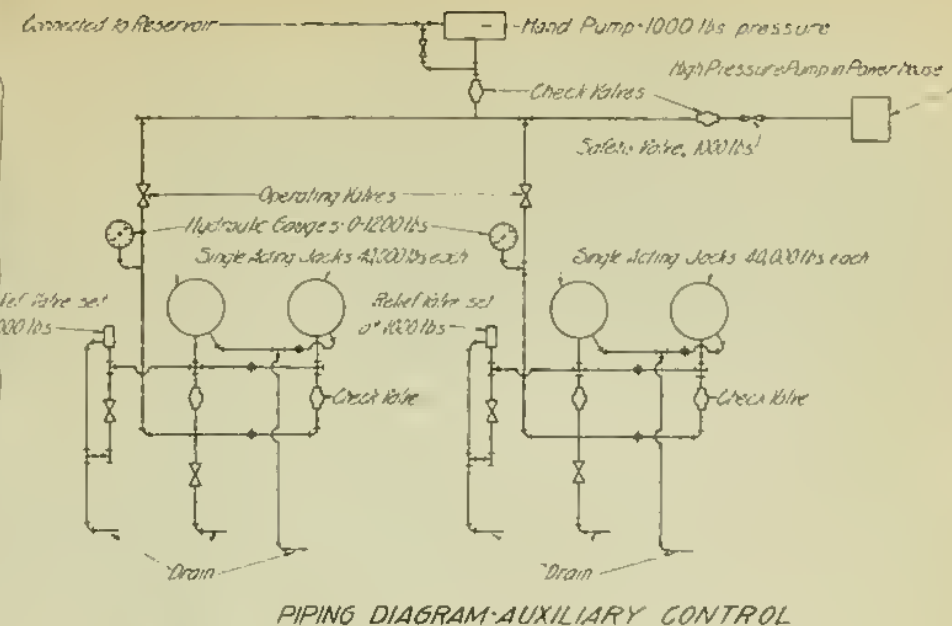
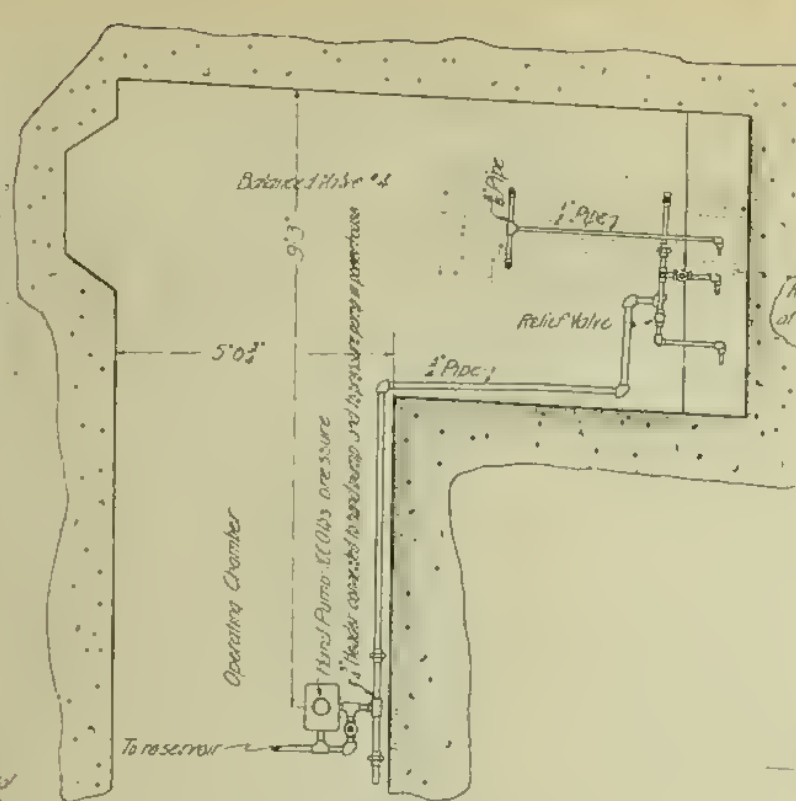
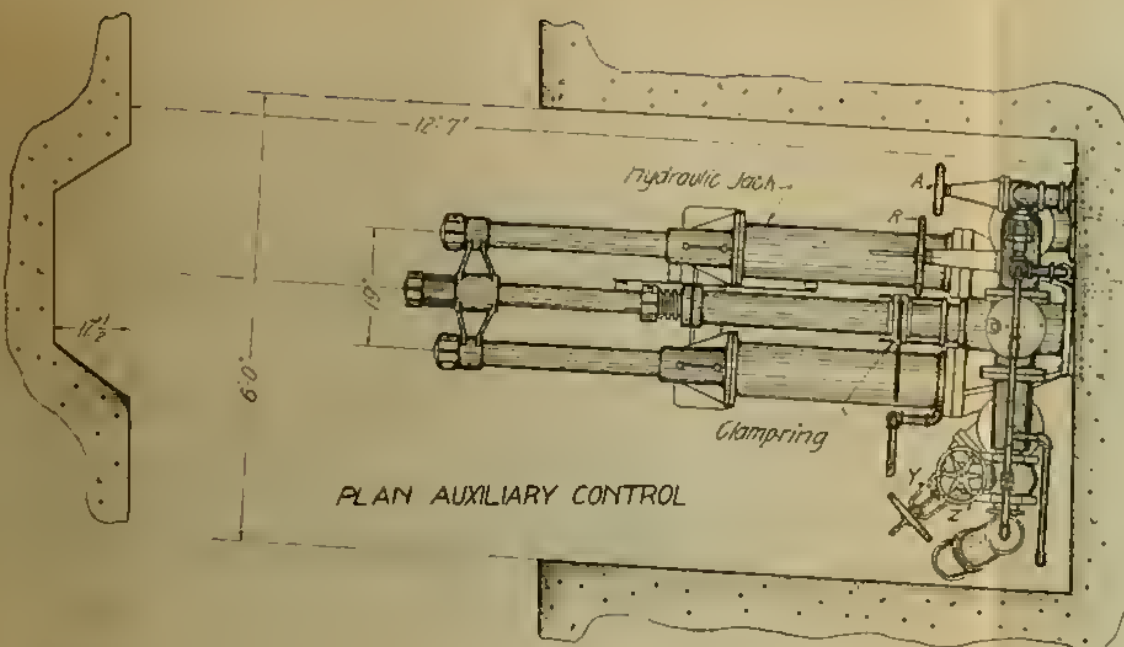
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
RIO GRANDE IRRIGATION PROJECT
NEW MEXICO-TEXAS
ELEPHANT BUTTE DAM
BALANCED VALVE, 60 INCH DIAMETER

tion No 242
178-D
rawing No 24-E-56

NO. 20398 PLATE 58 OF 88
1923

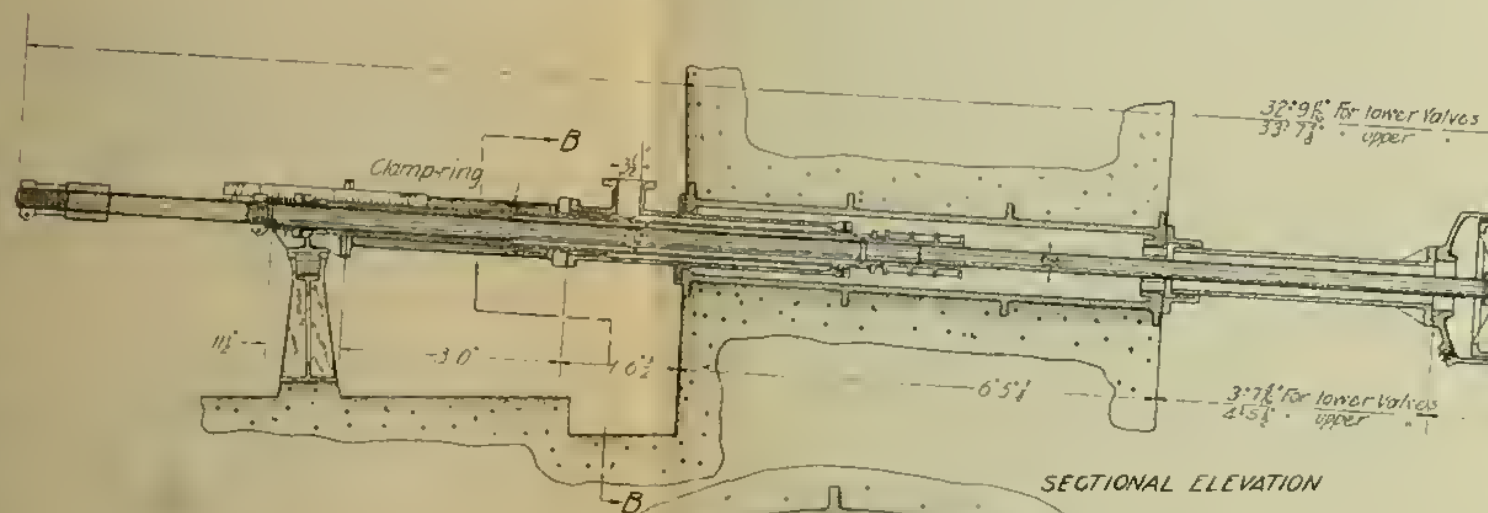
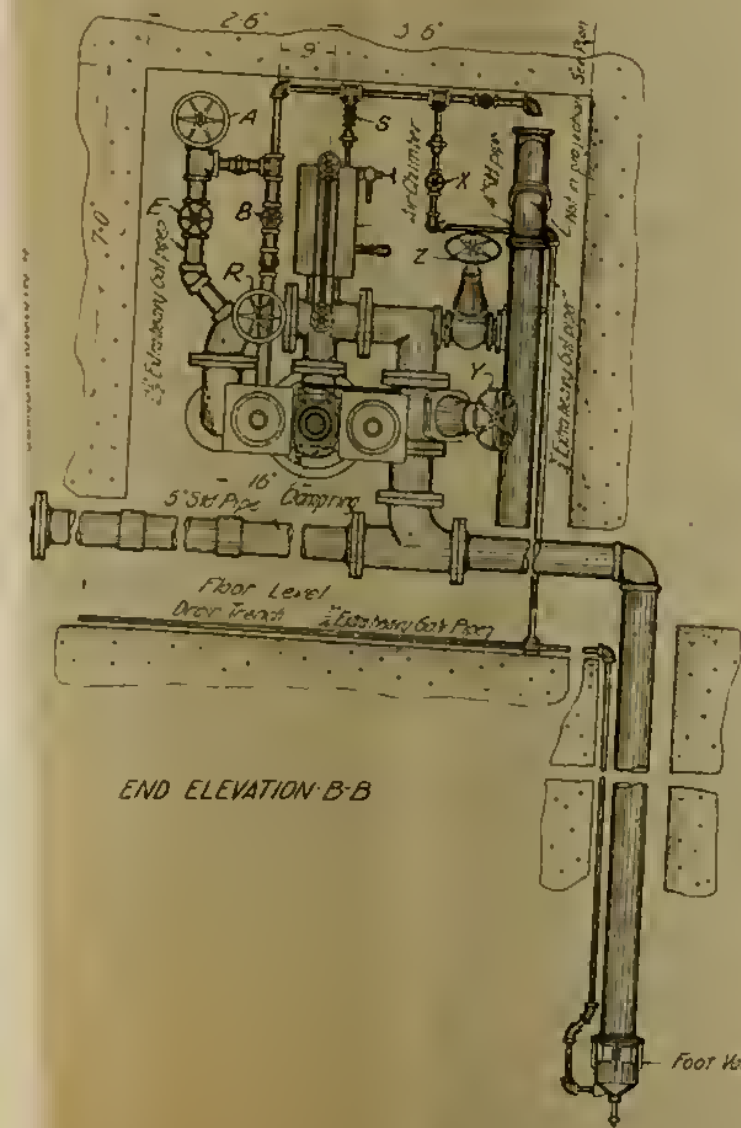
24-E-58

OPERATION OF BALANCED VALVES
 Open Balanced Valve. Assume all valves closed.
 Open valves A and Y.
 Open valve S, applying reservoir pressure under foot valve S, closing it.
 Open valve S, lift draft header, as vent on air reservoir being open, when draft header is filled, close air vent.
 Close valves S, R, and A. Draft tube action then becomes effective, producing vacuum in space of piston. If piston does not move under the above conditions, proceed as follows, using the 2 cylinder hydraulic jack. See that drain valves are closed.
 Open control valve slowly, until the piston has reached the desired position, then release hydraulic jack, close all valves but valve Z, and tighten clamp.
 Close Balanced Valve.
 Loosen clamp.
 Close valve Z. Open valve A. Close valve R.
 Open valve E slowly, applying reservoir pressure to the back of the piston until the balanced valve is closed.
 Close valve E. Close valve A.
 Move piston part way.
 Close valve E.
 Close valve A.
 Open valve Z.
 Tighten clamp.

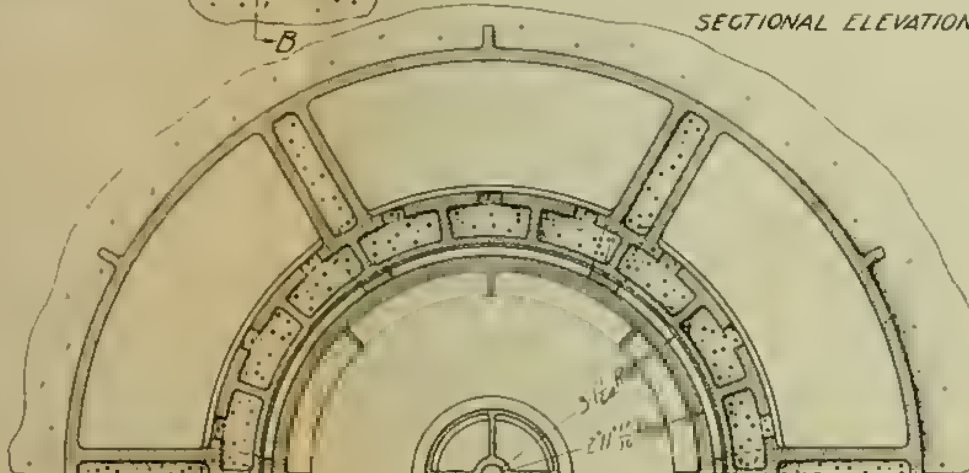


NOTE
 Balanced valves Nos 1 and 2 (upper) have a horizontal angle of 90° with axis of dam and vertical angle of 13° 30'.
 Balanced valves Nos 3 and 4 (lower) have a horizontal angle of 86° 38' with axis of dam and vertical angle of 3° 30'.

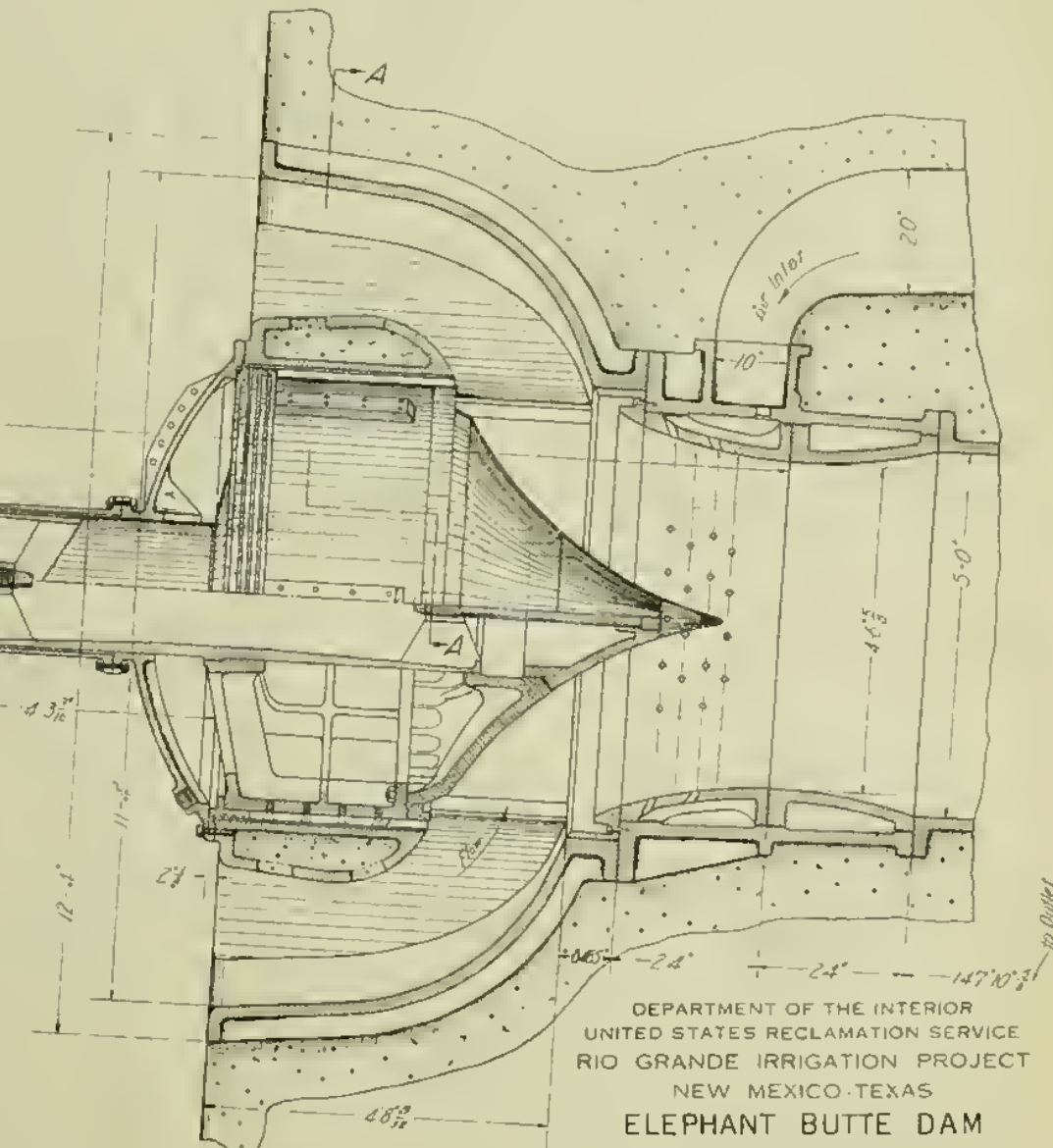
AUXILIARY CONTROL PIPING PLAN
 SCALE



SECTIONAL ELEVATION

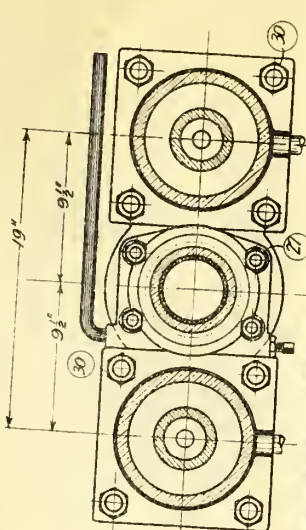


SECTION A-A

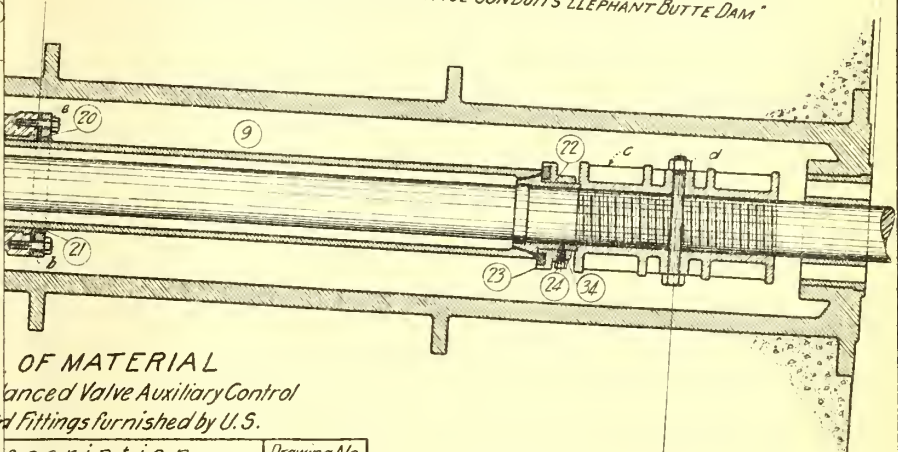


DEPARTMENT OF THE INTERIOR
 UNITED STATES RECLAMATION SERVICE
 RIO GRANDE IRRIGATION PROJECT
 NEW MEXICO, TEXAS
ELEPHANT BUTTE DAM
BALANCED VALVE, 60 INCH DIAMETER
 NO 20398 PLATE 58 OF 68
 1923

Balanced Valve Specification No 242
 Auxiliary Control 178-D
 For location in dam see drawing No 24-E-56



NOTE: Parts marked a-g are reused from present construction, shown on drawing No. 4. Specification No. 242 "BALANCED VALVES FOR SERVICE CONDUITS ELEPHANT BUTTE DAM"

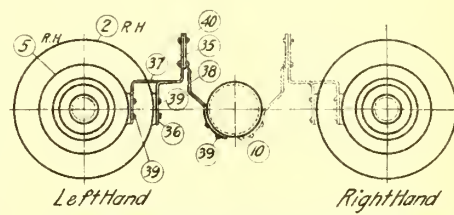


OF MATERIAL

Balanced Valve Auxiliary Control

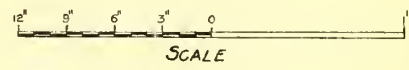
High Pressure Operating Fittings furnished by U.S. Drawing No 24-E-54

Description	Drawing No.
ing Tube Guide	24-E-50
der, see note on detail drawing	24-E-52
n	"
n Ring	"
der Head, see note on detail drawing	24-E-50
der Cover Stand	"
head	24-E-52
n Rod Clamp Nut	"
ing Tube	24-E-51
od	24-E-52
od Clamp Nut	"
od Nut	"
g Clamp Nut	"
	24-E-51
ing Tube Packing Ring	"
ing Tube Packing	"
Strap Housing	24-E-52
ing Tube Guide Stuffing Box Gland	24-E-50
ing Tube Guide Stuffing Box	"
" " " "	"
" " " " Packing	"
ing Tube Seat	24-E-51
" " " " Ring	"
" " " " Bolt	"
rews $\frac{1}{2}$ " x 23"	"
Head Screws	24-E-52
, Bronze Nuts $\frac{3}{4}$ " x 13"	24-E-50
" " $\frac{1}{2}$ " x 33"	"
ine Bolts $\frac{3}{8}$ " x 24"	24-E-52
" $\frac{1}{8}$ " x 4"	"
$\frac{1}{4}$ " x 24"	"
ard Grease Cups $\frac{1}{2}$ " pipe shank	24-E-49
ut Wrench	24-E-52
Washers	24-E-51
on Indicator Gage, see note on detail drawing	"
" " Bracket Cylinder	"
" " " " Cylinder Cover	"
" " " " Hand	"
illister Head Screws	24-E-49
ttion Head Screws, hex nuts	"
High Pressure Hydraulic Packing	"



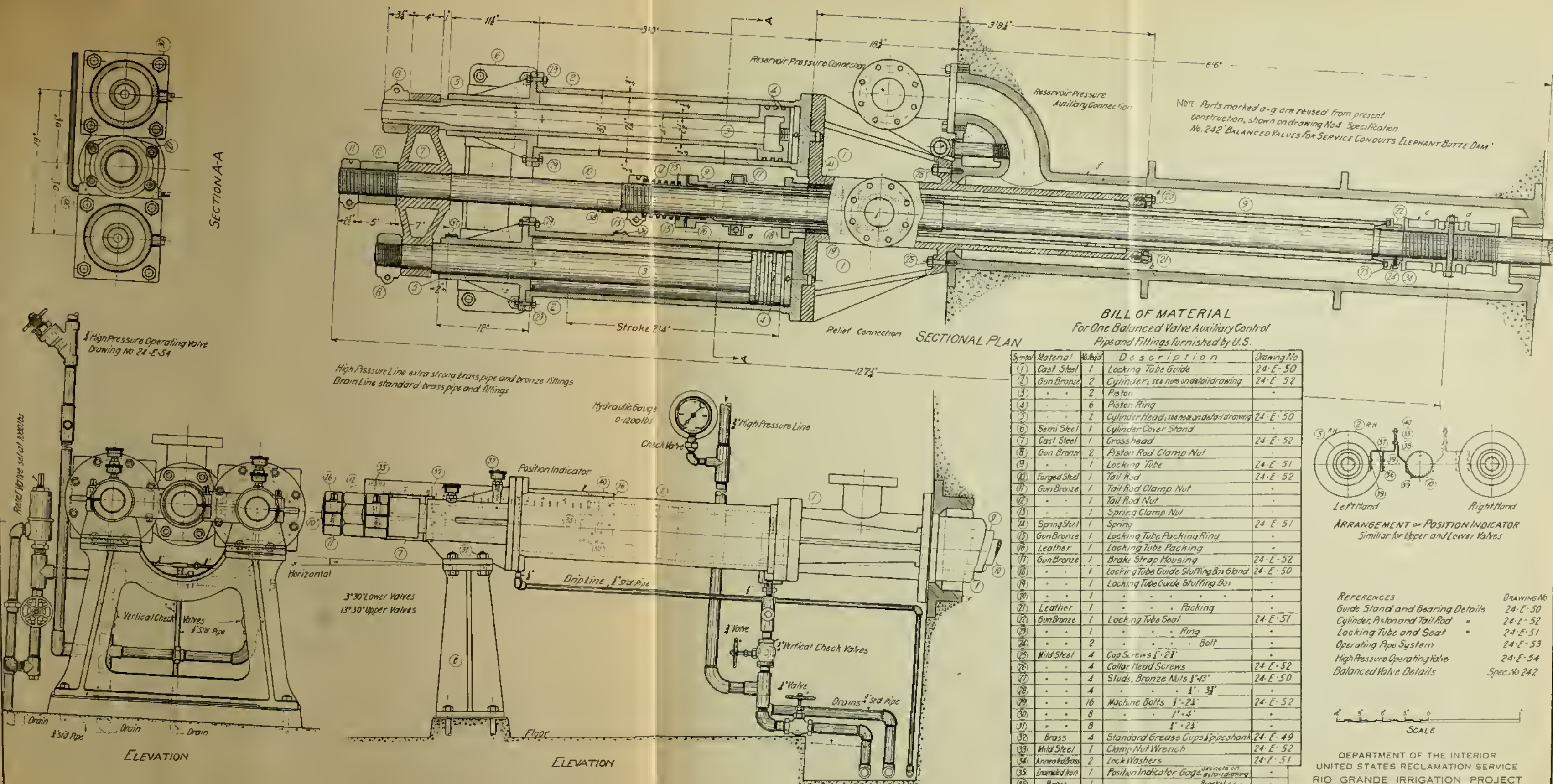
ARRANGEMENT OF POSITION INDICATOR
Similar for Upper and Lower Valves

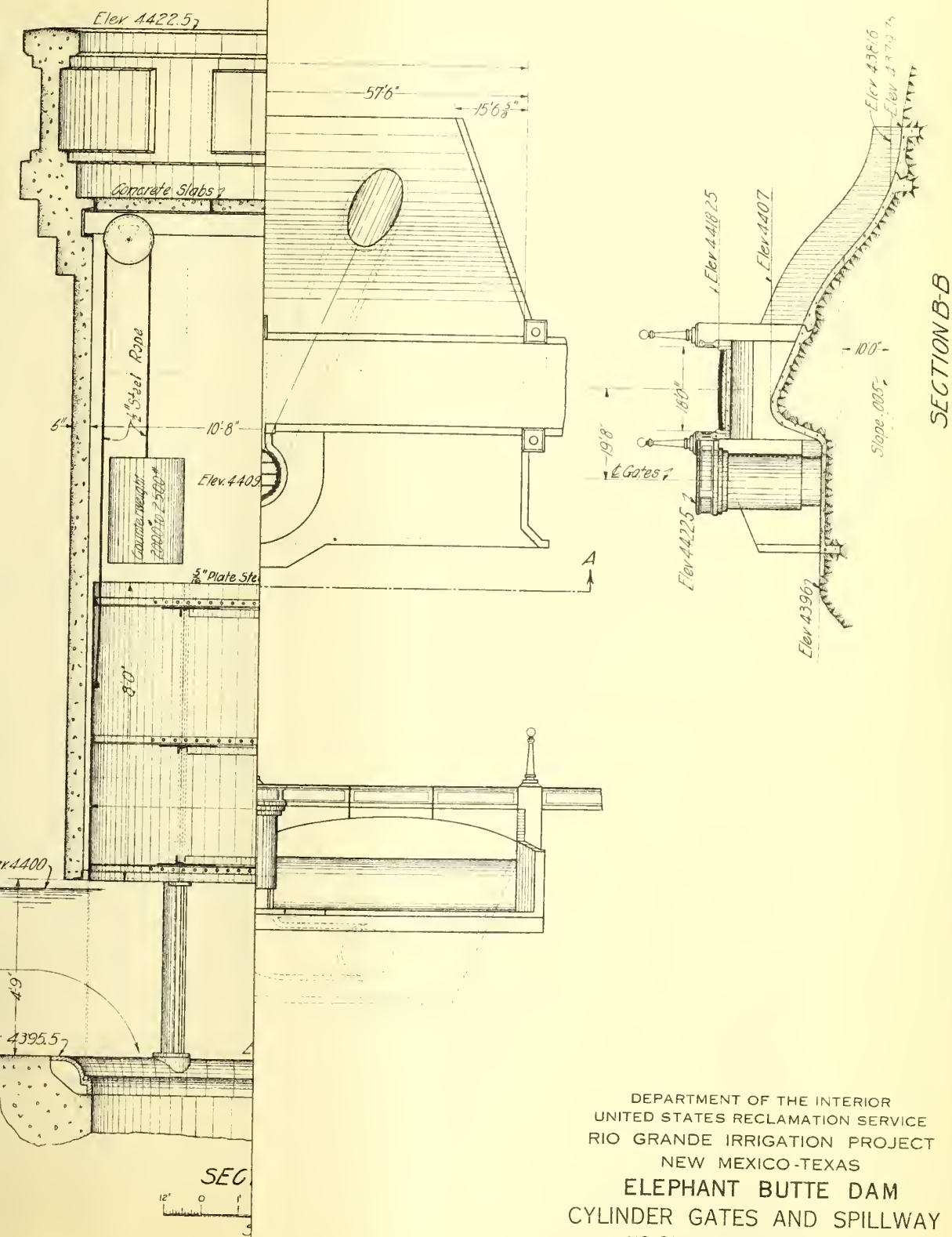
REFERENCES:	Drawing No
Guide Stand and Bearing Details	24-E-50
Cylinder, Piston and Tail Rod	24-E-52
Locking Tube and Seat	24-E-51
Operating Pipe System	24-E-53
High Pressure Operating Valve	24-E-54
Balanced Valve Details	Spec. No. 242

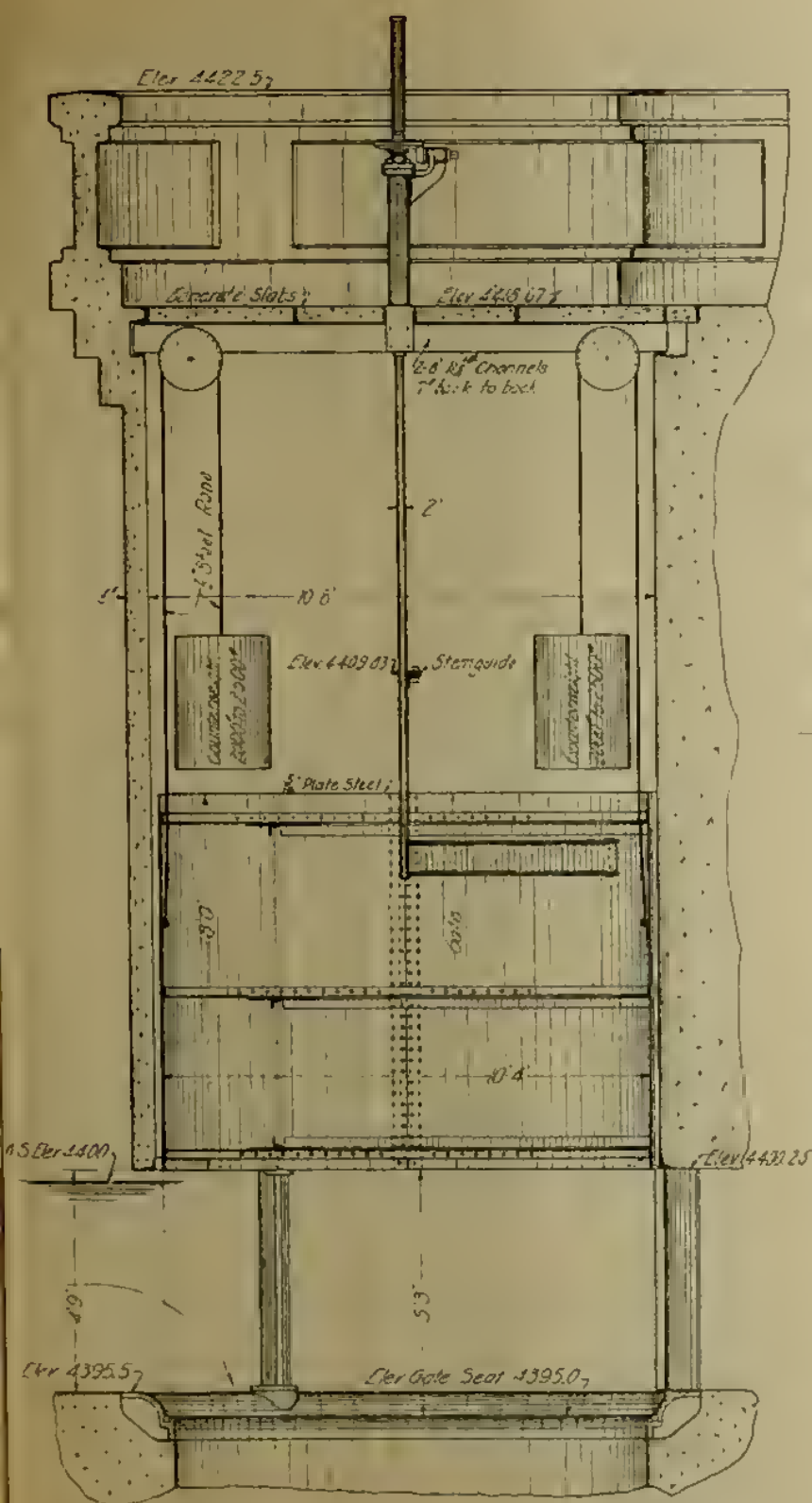


DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
RIO GRANDE IRRIGATION PROJECT
NEW MEXICO-Texas
ELEPHANT BUTTE DAM
BALANCED VALVE AUXILIARY CONTROL

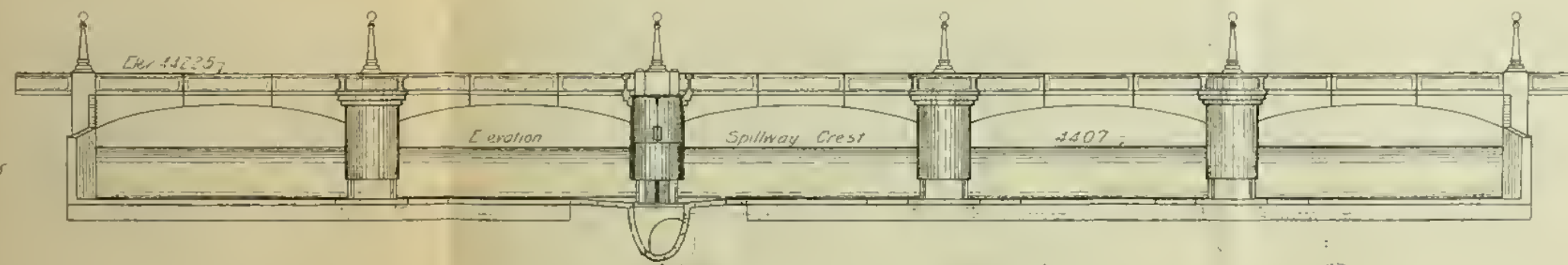
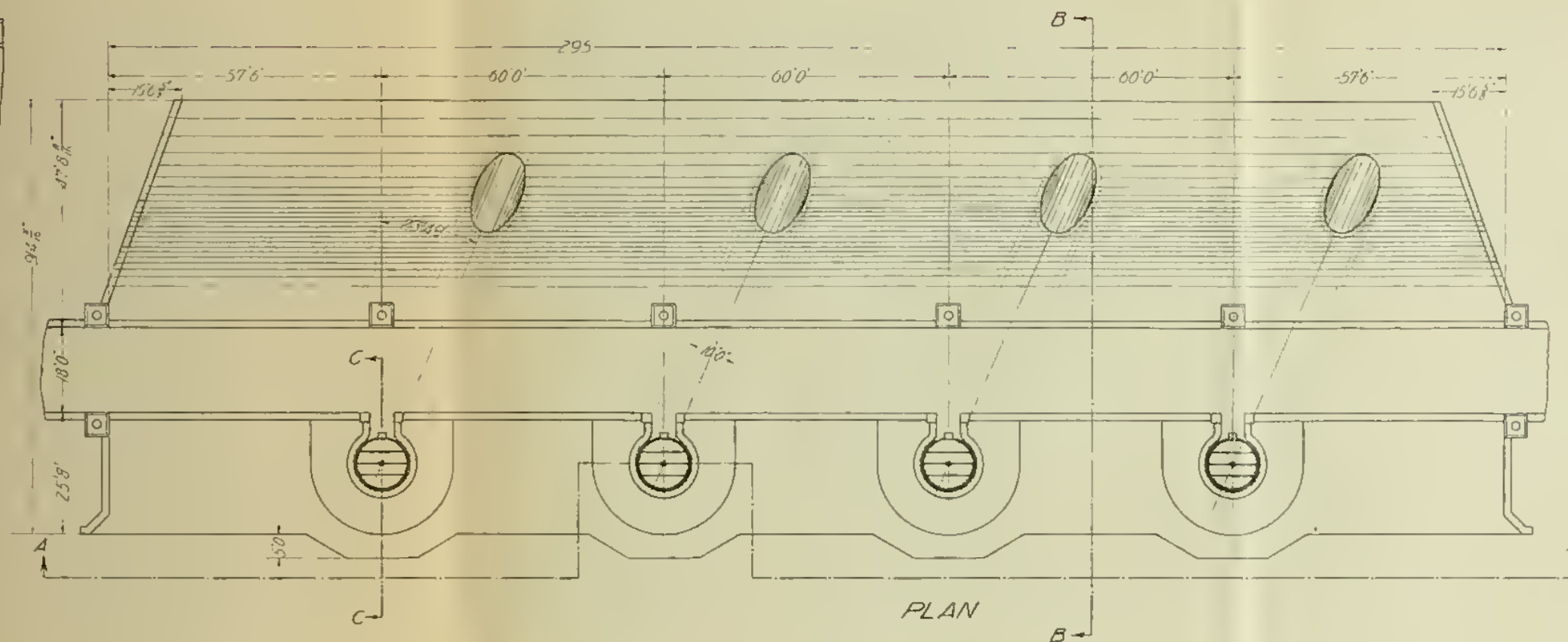
NO. 20399 PLATE 59 OF 88
1923



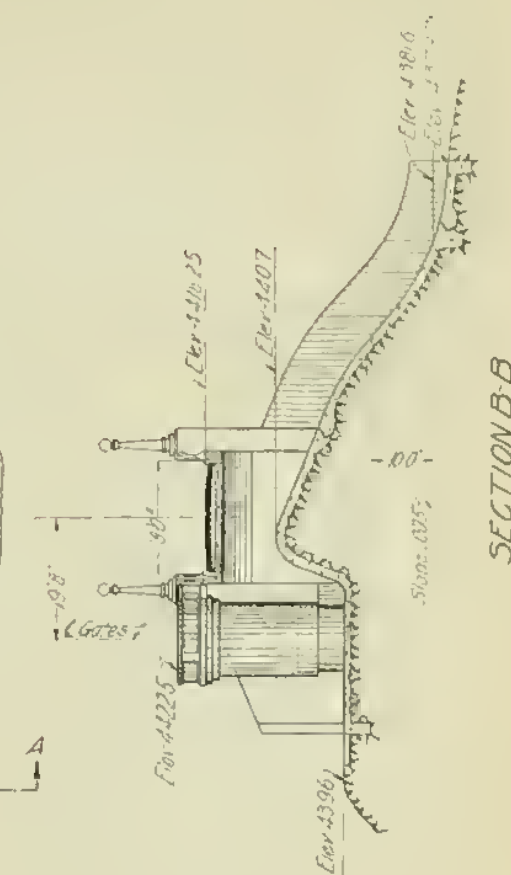
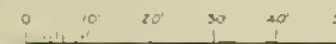




SECTION C-C
SCALE

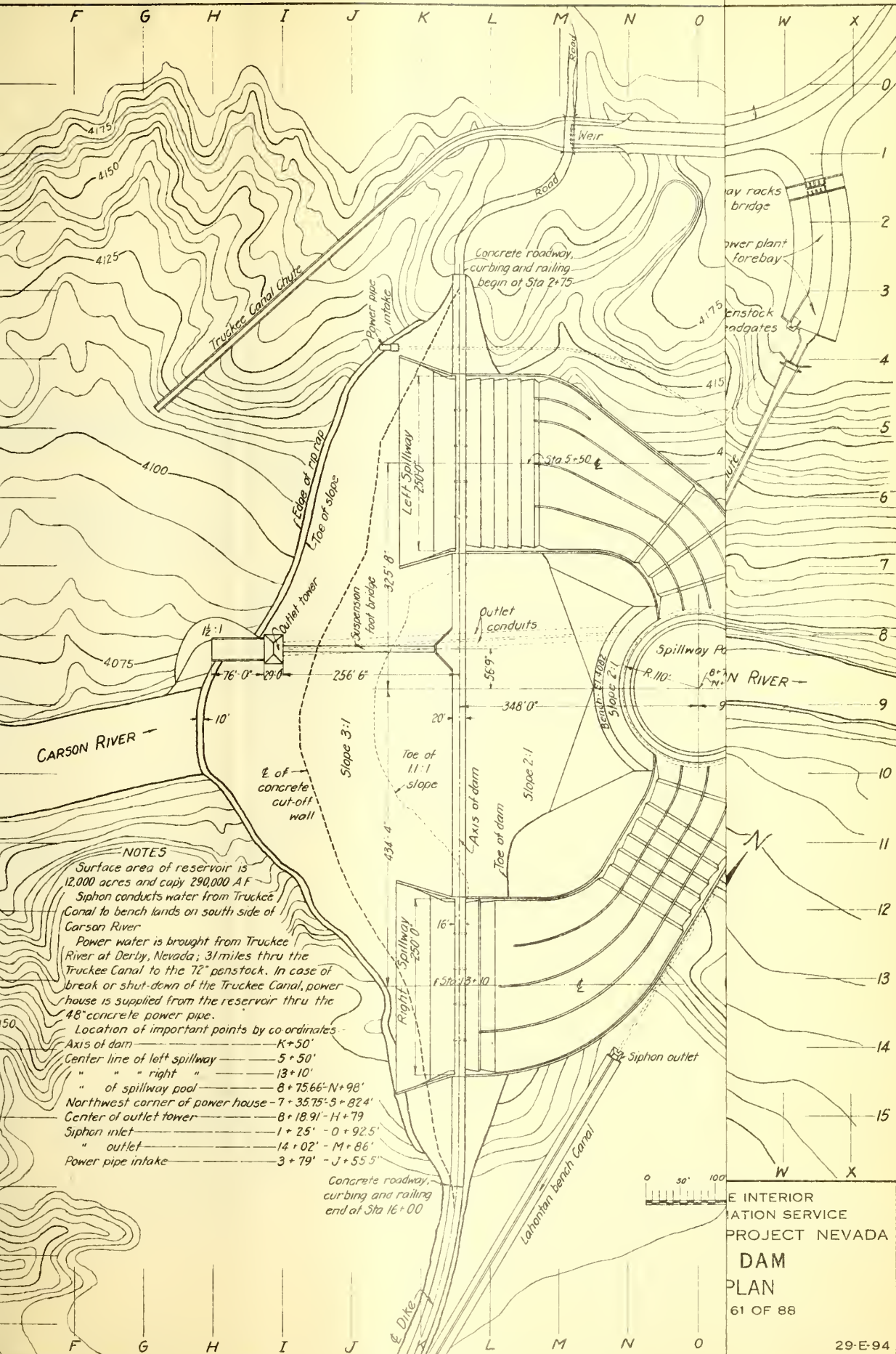


SECTIONAL ELEVATION A-A

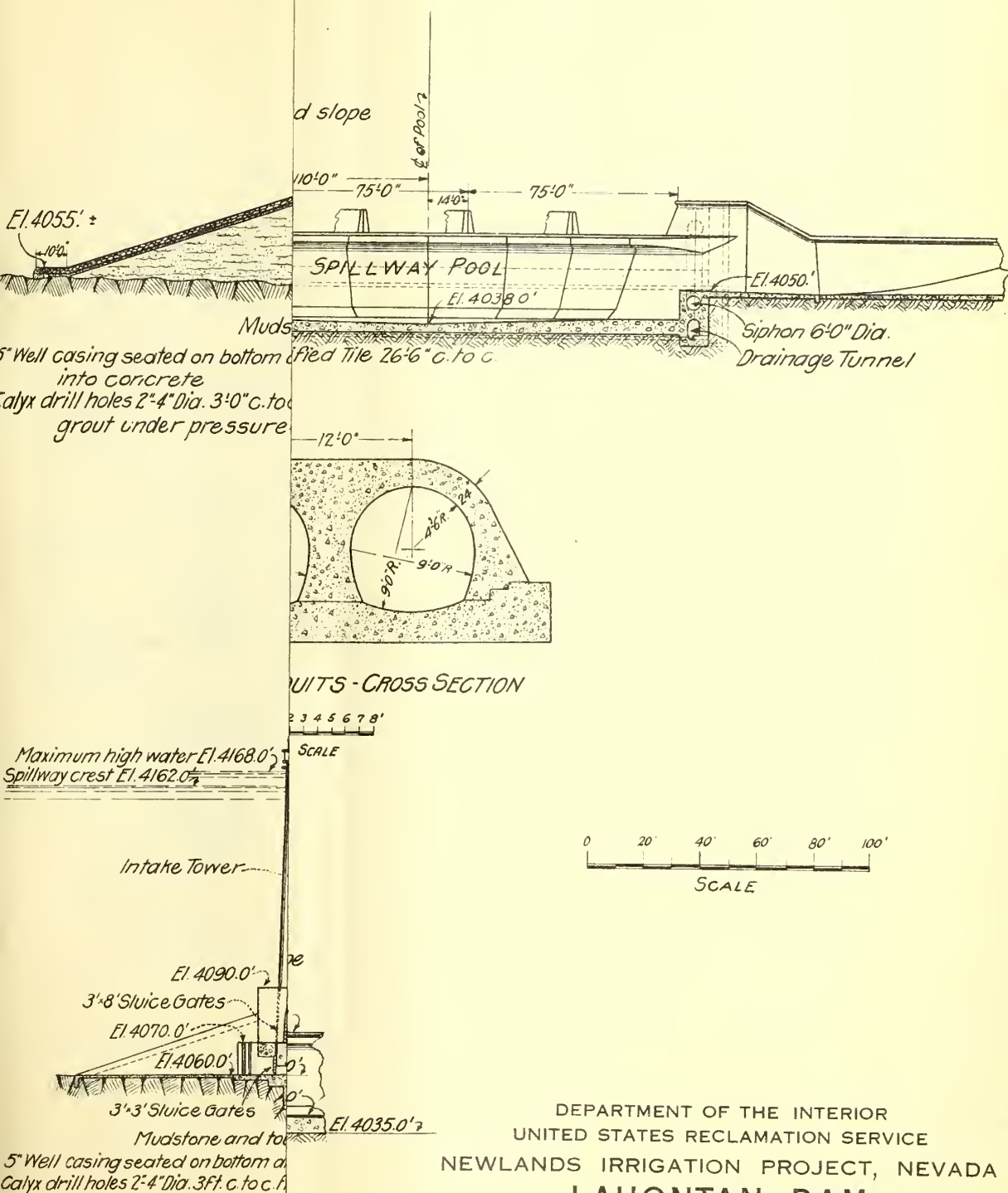


SECTION B-B

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
RIO GRANDE IRRIGATION PROJECT
NEW MEXICO-TEXAS
ELEPHANT BUTTE DAM
CYLINDER GATES AND SPILLWAY
NO 20400 PLATE 60 OF 88
1923







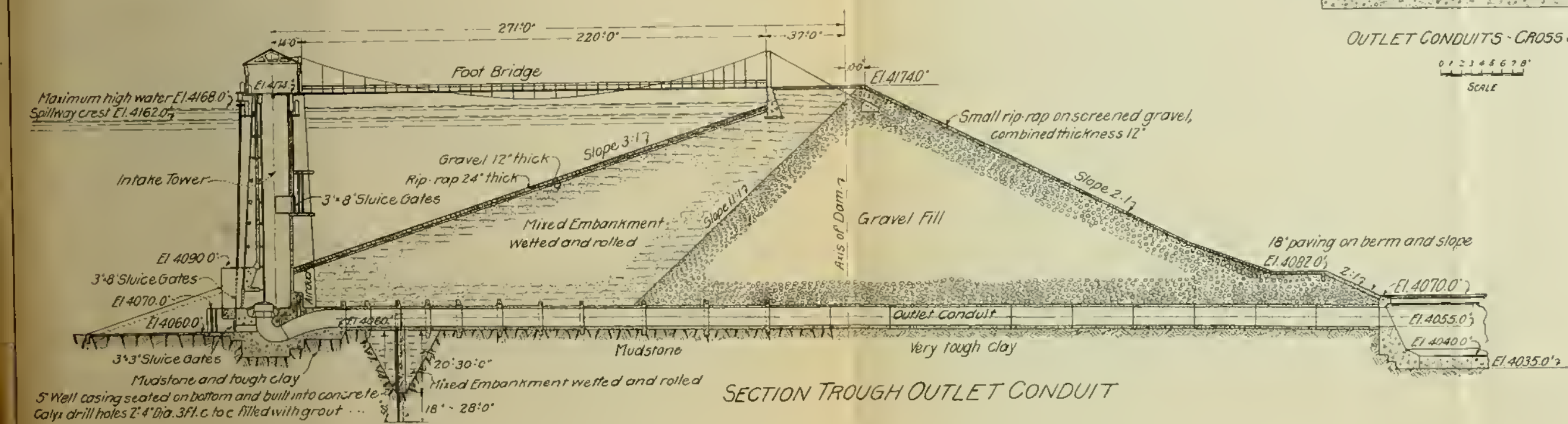
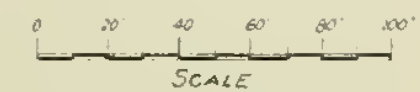
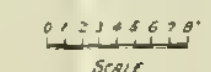
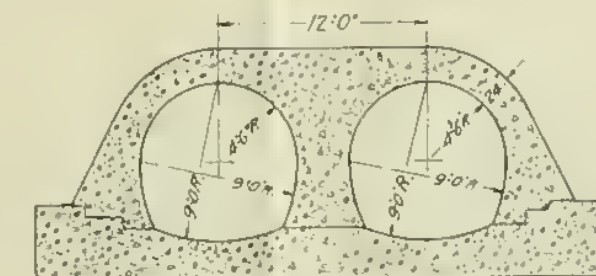
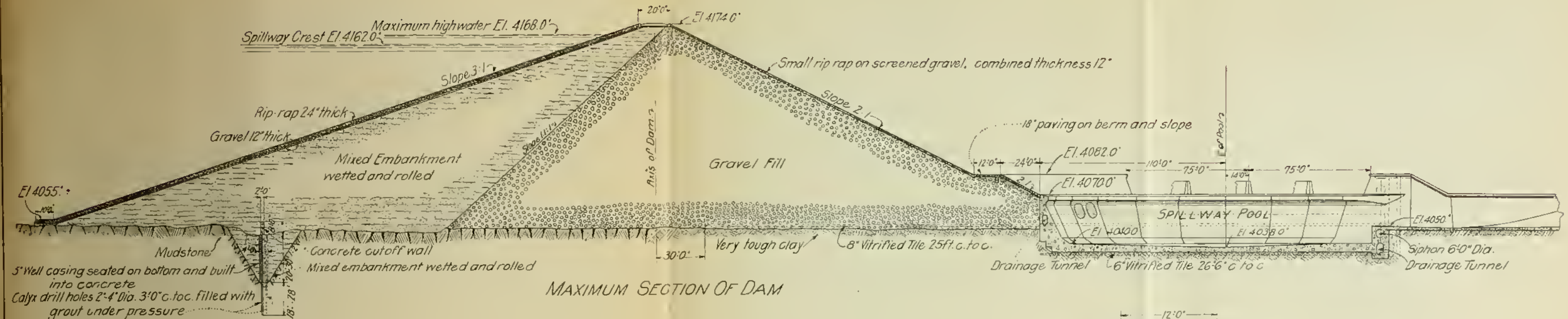
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NEWLANDS IRRIGATION PROJECT, NEVADA

LAHONTAN DAM

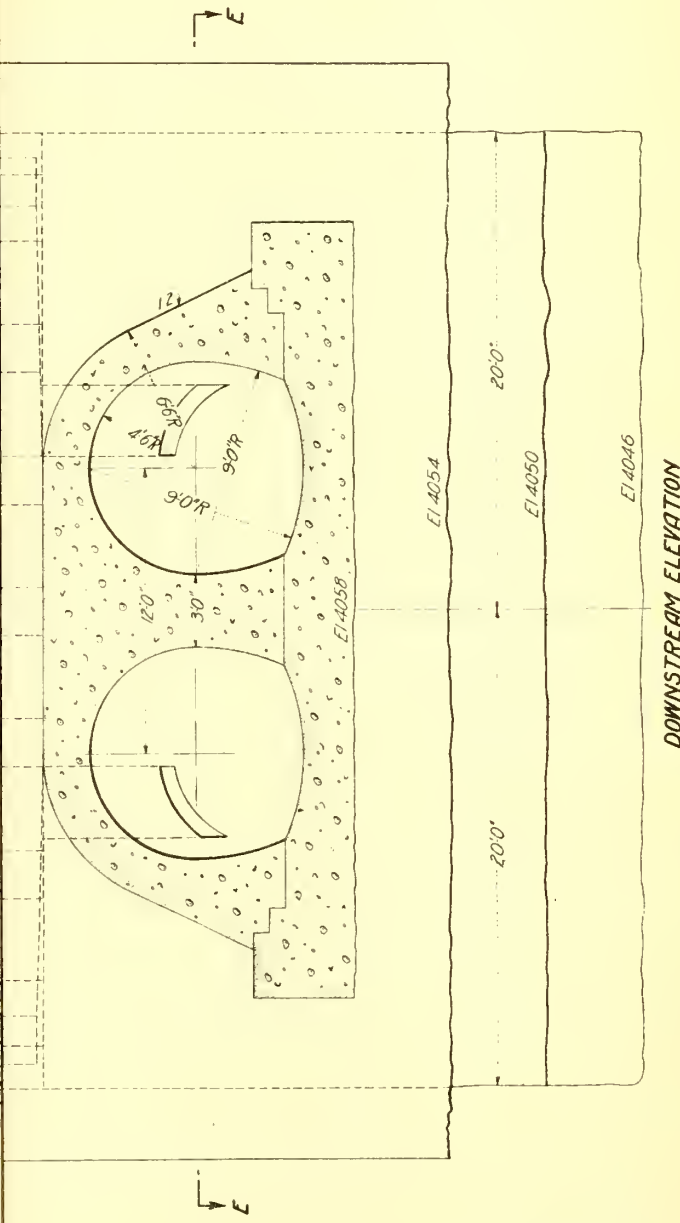
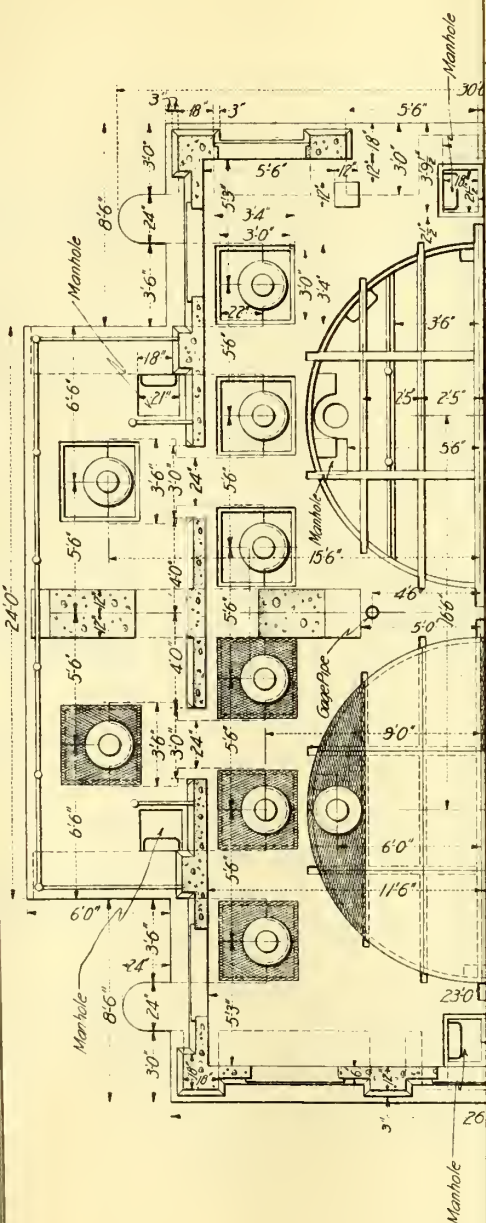
SECTIONS OF DAM AND OUTLET

NO. 20402 PLATE 62 OF 88

1923



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NEWLANDS IRRIGATION PROJECT, NEVADA
LAHONTAN DAM
SECTIONS OF DAM AND OUTLET
NO. 20402 PLATE 62 OF 88
1923



NOTE: This Drawing compiled from Design Drawings made in the Project Office

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NEWLANDS IRRIGATION PROJECT, NEVADA
LAHONTAN DAM
GATE TOWER, DOWNSTREAM ELEVATION

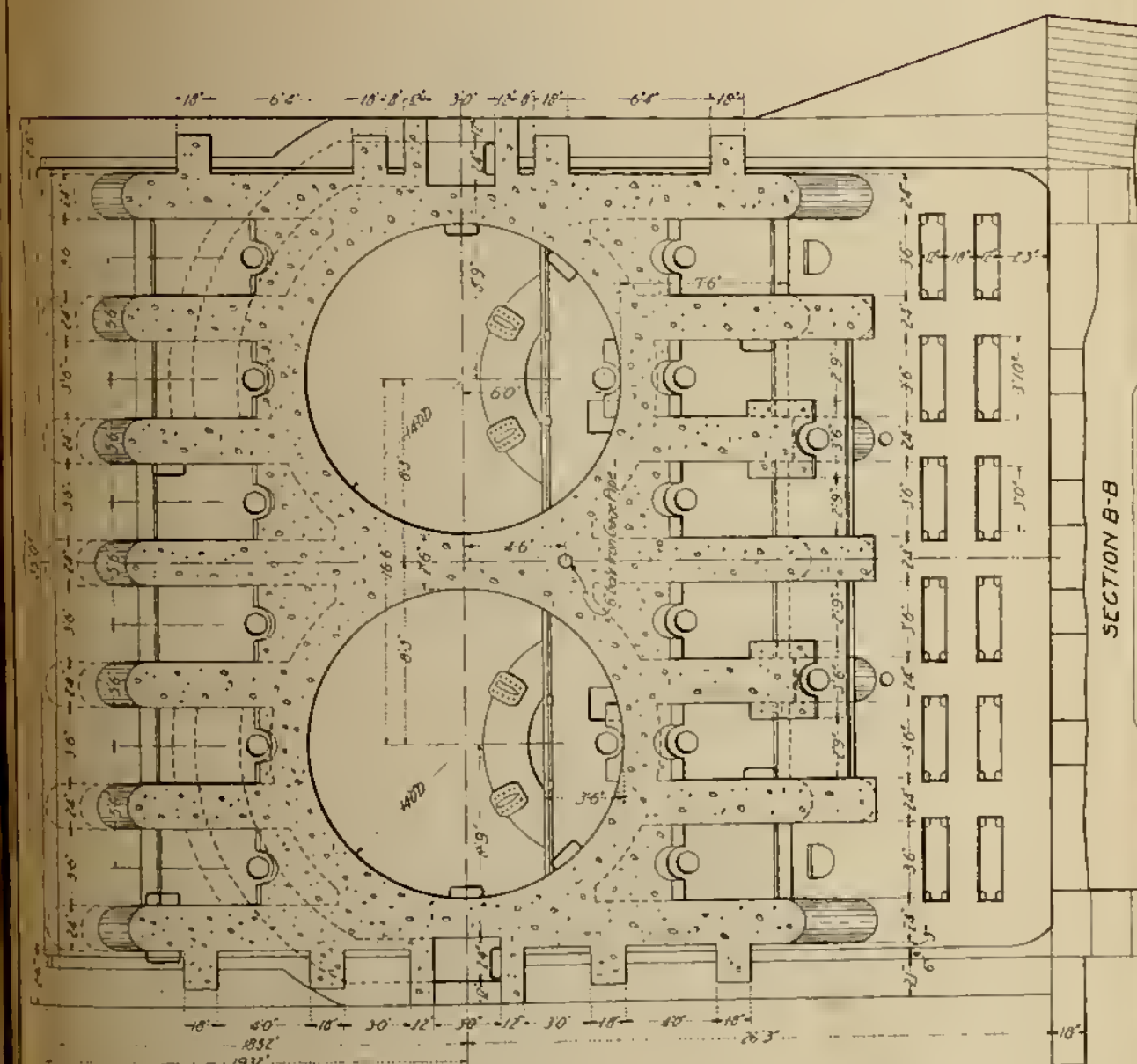
NO. 20403 PLATE 63 OF 88
1923



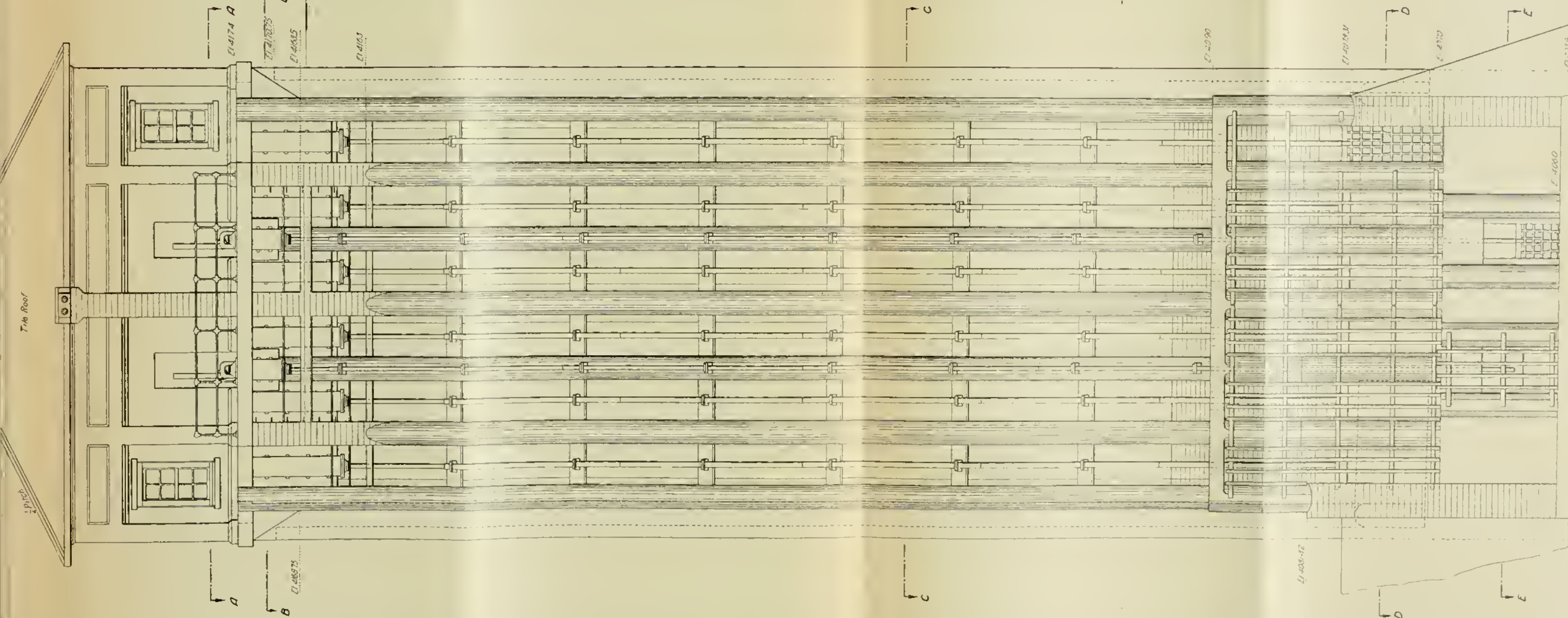
Note Reinforcement not shown



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NEWLANDS IRRIGATION PROJECT, NEVADA
LAHONTAN DAM
GATE TOWER, DOWNSTREAM ELEVATION
NO 20403 PLATE 63 OF 88
1923



Note: Reinforcement not shown



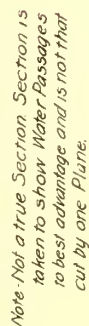
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NEWLANDS IRRIGATION PROJECT, NEVADA
LAHONTAN DAM
GATE TOWER, UPSTREAM ELEVATION

NOTE: This drawing compiled from Design
Drawings made in the Project Office

NO 20404 PLATE 64 OF 88
1923

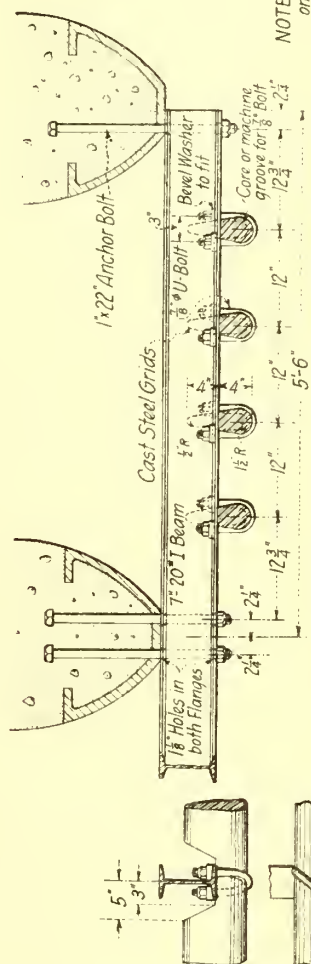
2 of 5

29 C-24



NOTE - This Drawing compiled from Design Drawings
made in the Project Office

NO. 20405 PLATE 65 OF 88
1923



NOTE: Details for 3'x3' Gates differ only in Distance between Piers

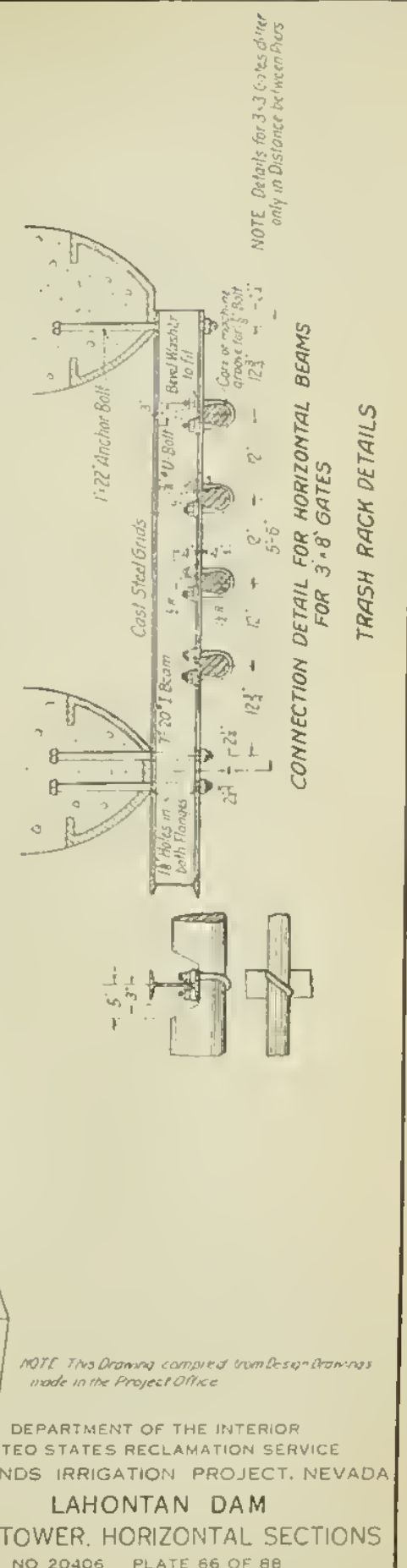
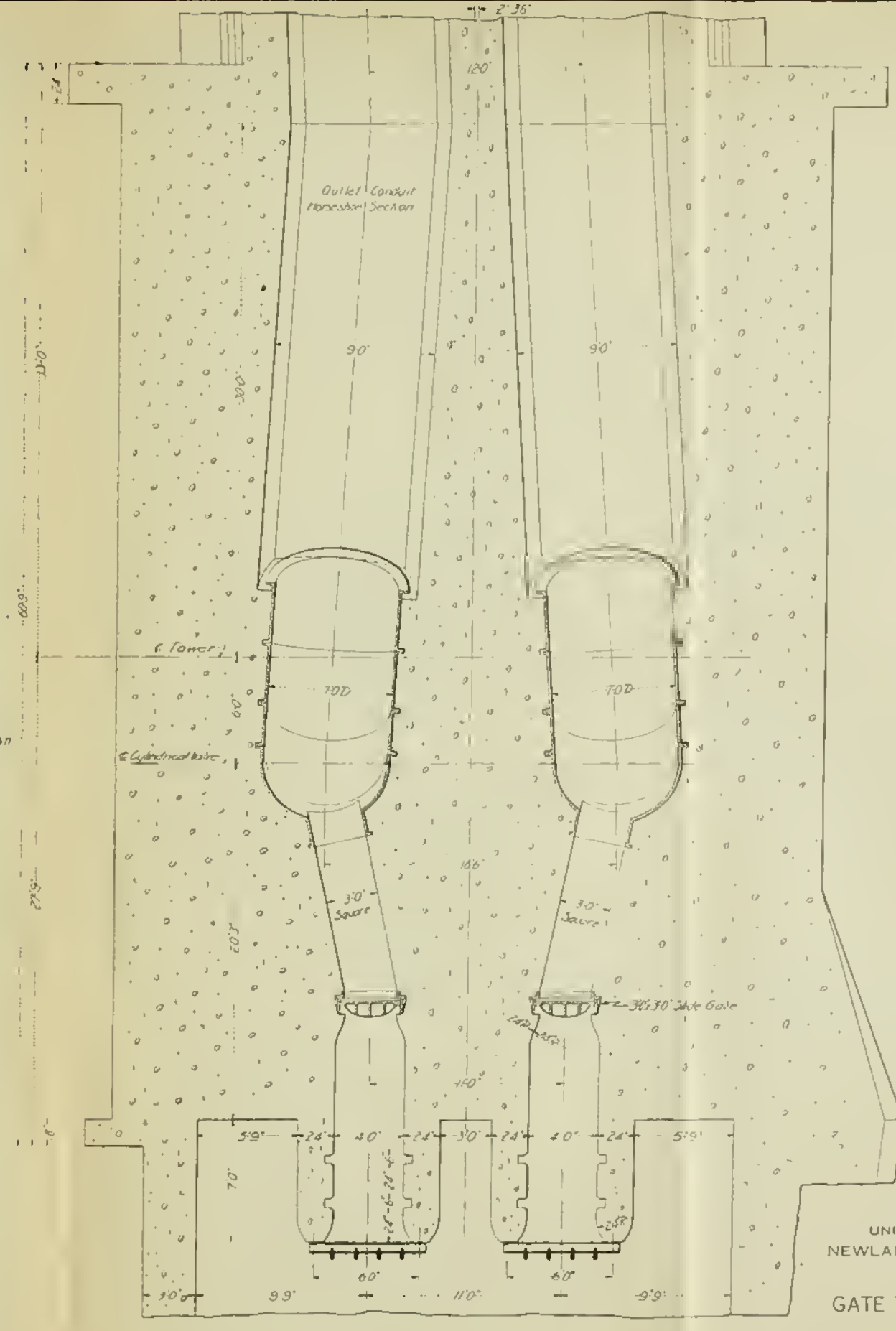
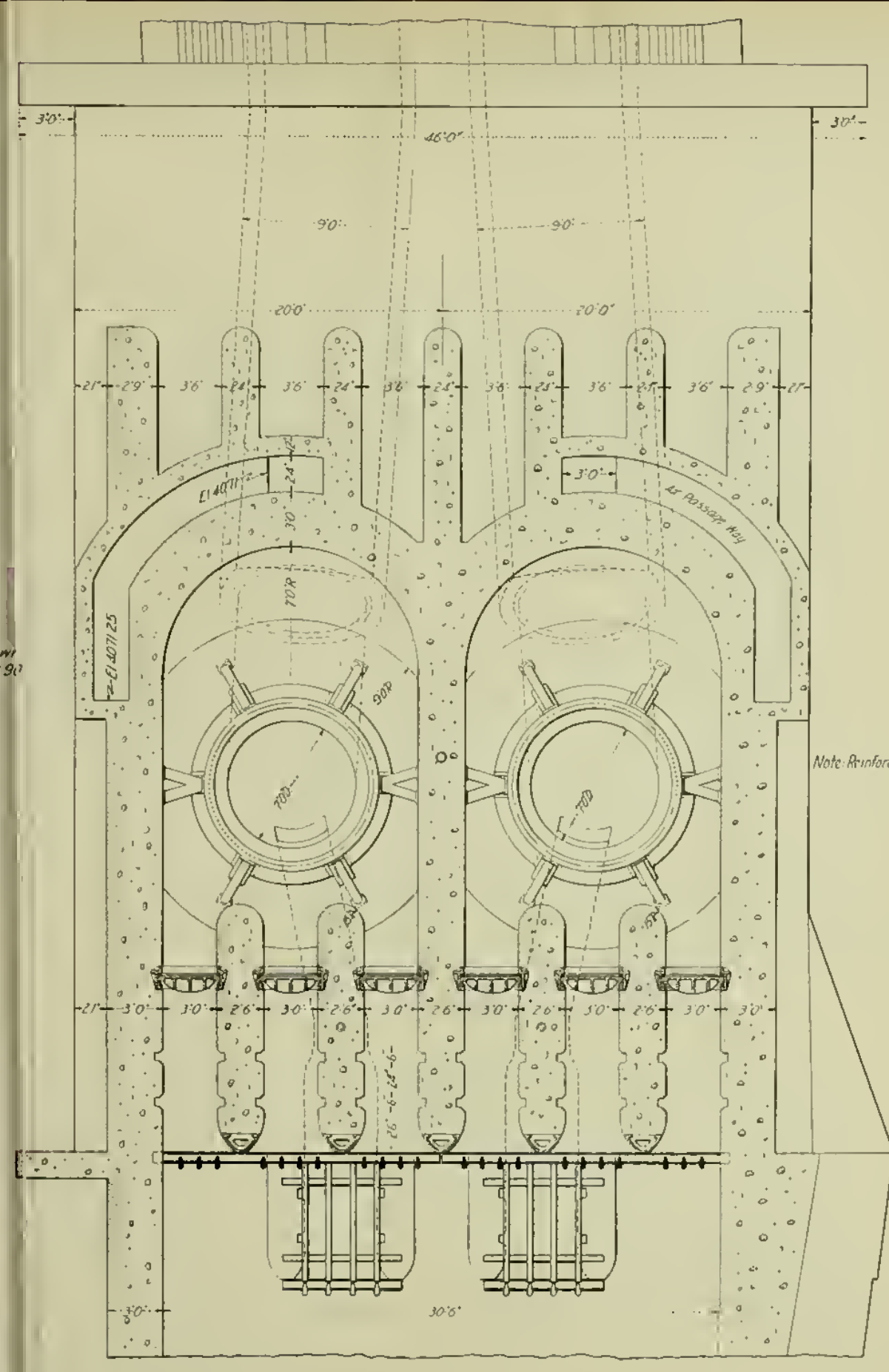
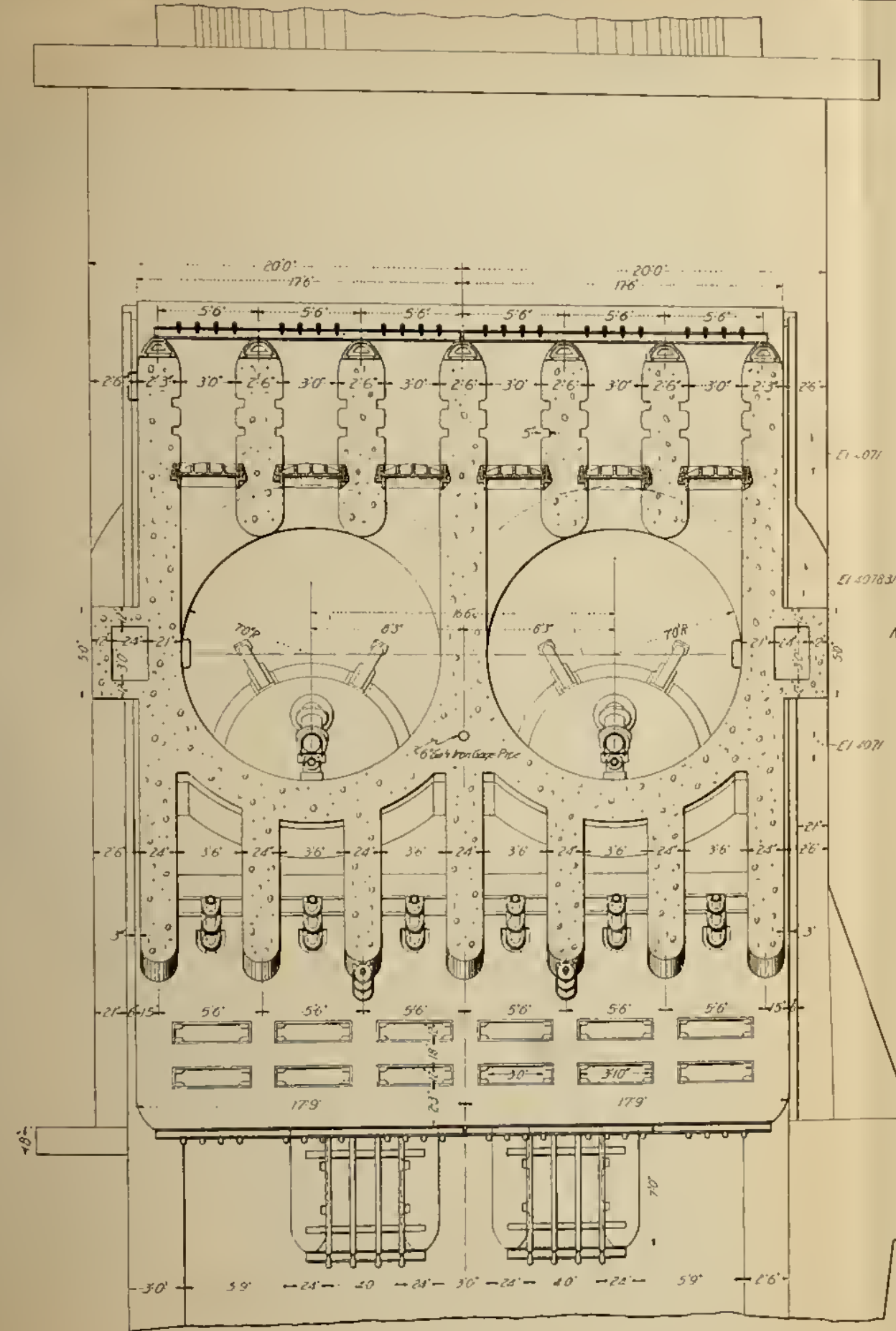
CONNECTION DETAIL FOR HORIZONTAL BEAMS
FOR 3'x8' GATES

TRASH RACK DETAILS

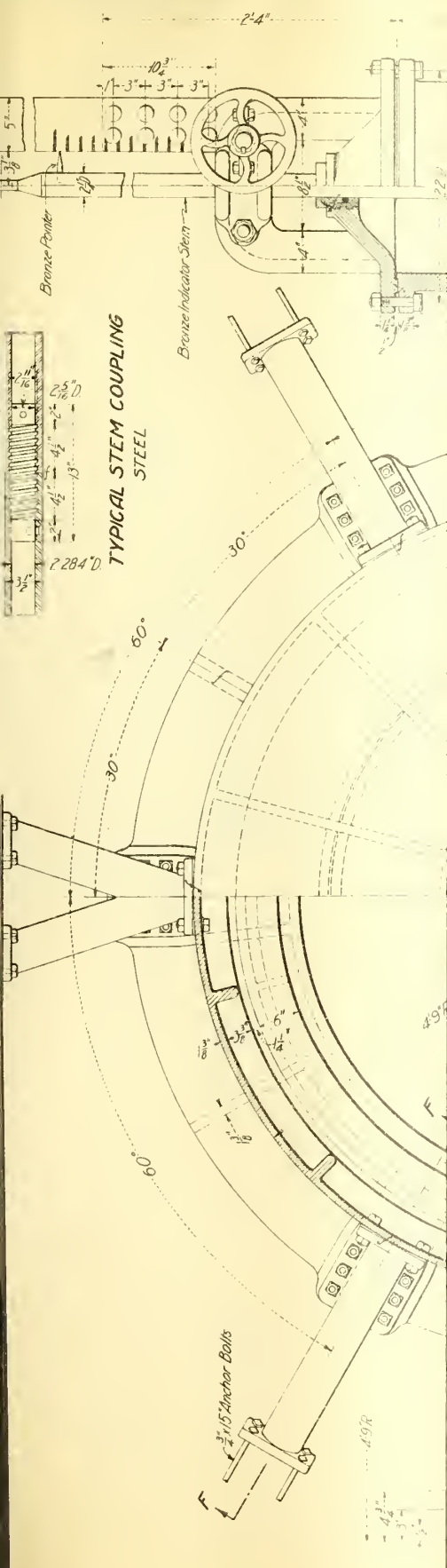
NOTE: This Drawing compiled from Design Drawings
made in the Project Office.

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NEWLANDS IRRIGATION PROJECT, NEVADA
LAHONTAN DAM
GATE TOWER, HORIZONTAL SECTIONS

NO. 20406 PLATE 66 OF 88
1923

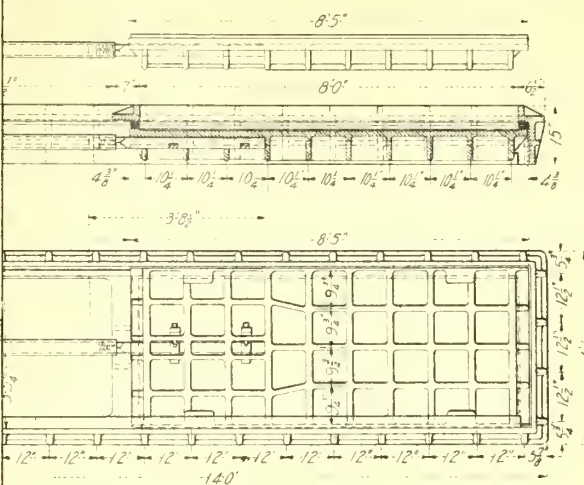


DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NEWLANDS IRRIGATION PROJECT, NEVADA
LAHONTAN DAM
GATE TOWER, HORIZONTAL SECTIONS
NO 20406 PLATE 66 OF 88
1923



3'-0\"/>

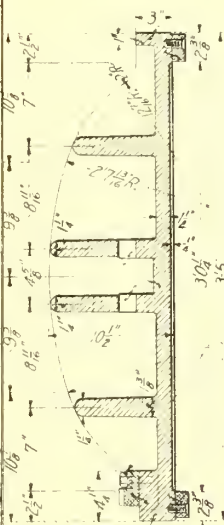
Note: Details of 3'x8\"/>



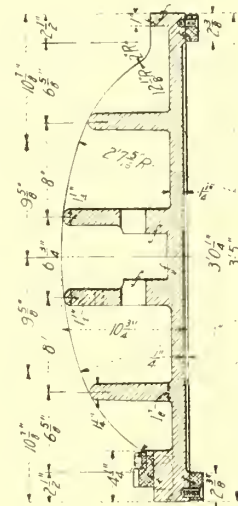
30x80 REGULATING GATE

CAST IRON

Note: Lower 3'0\"/>

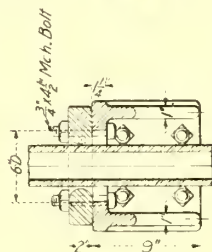
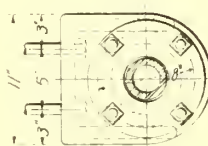


SECTION THRU 30x30 GATE LEAF

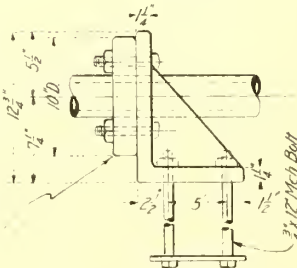


SECTION THRU LOWER 30x80 GATE LEAF

Note: Sections taken thru lower Stem Pin and upper Wedge Pad



Inside Dia Ring 3 1/2\"/>



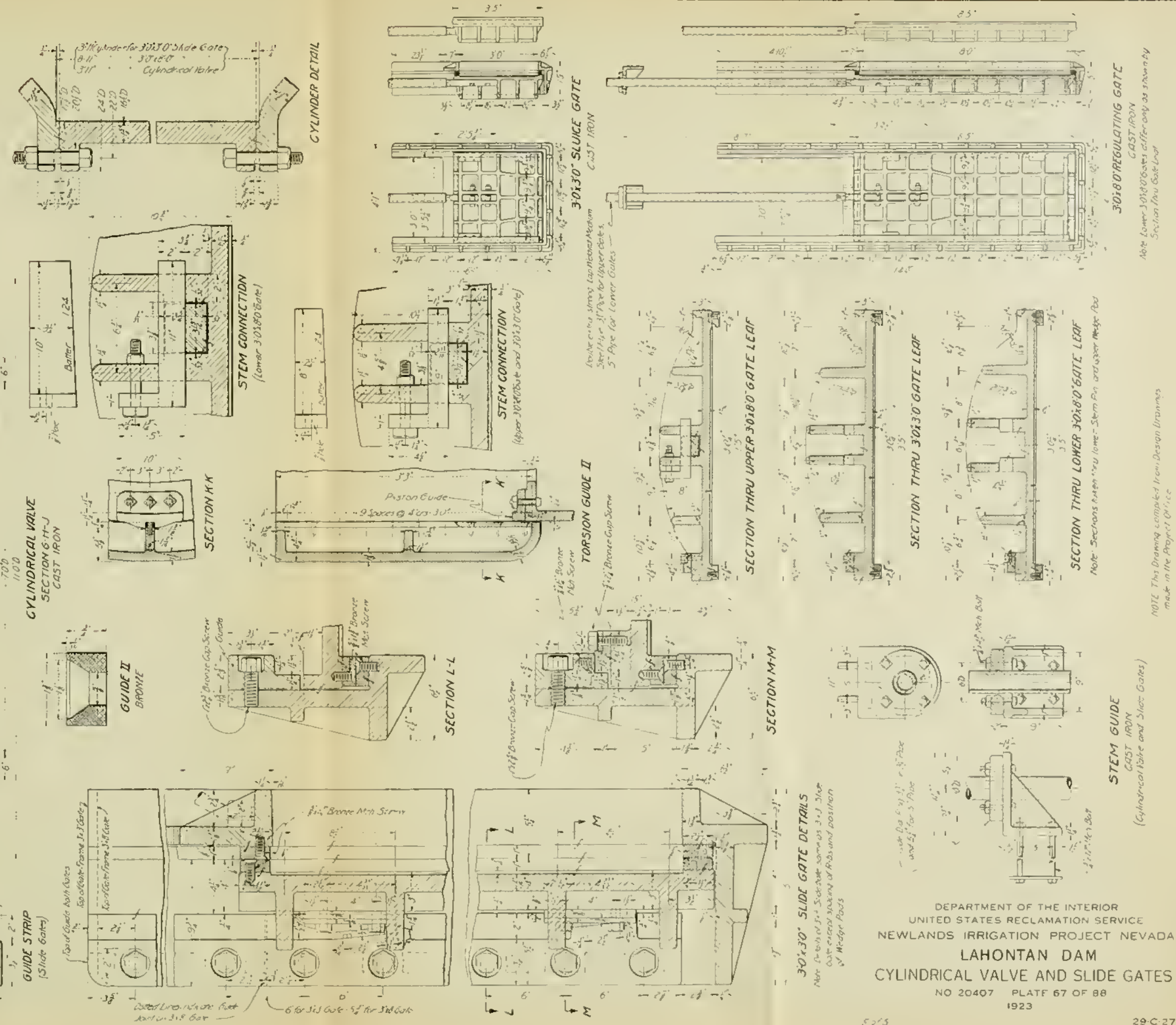
STEM GUIDE

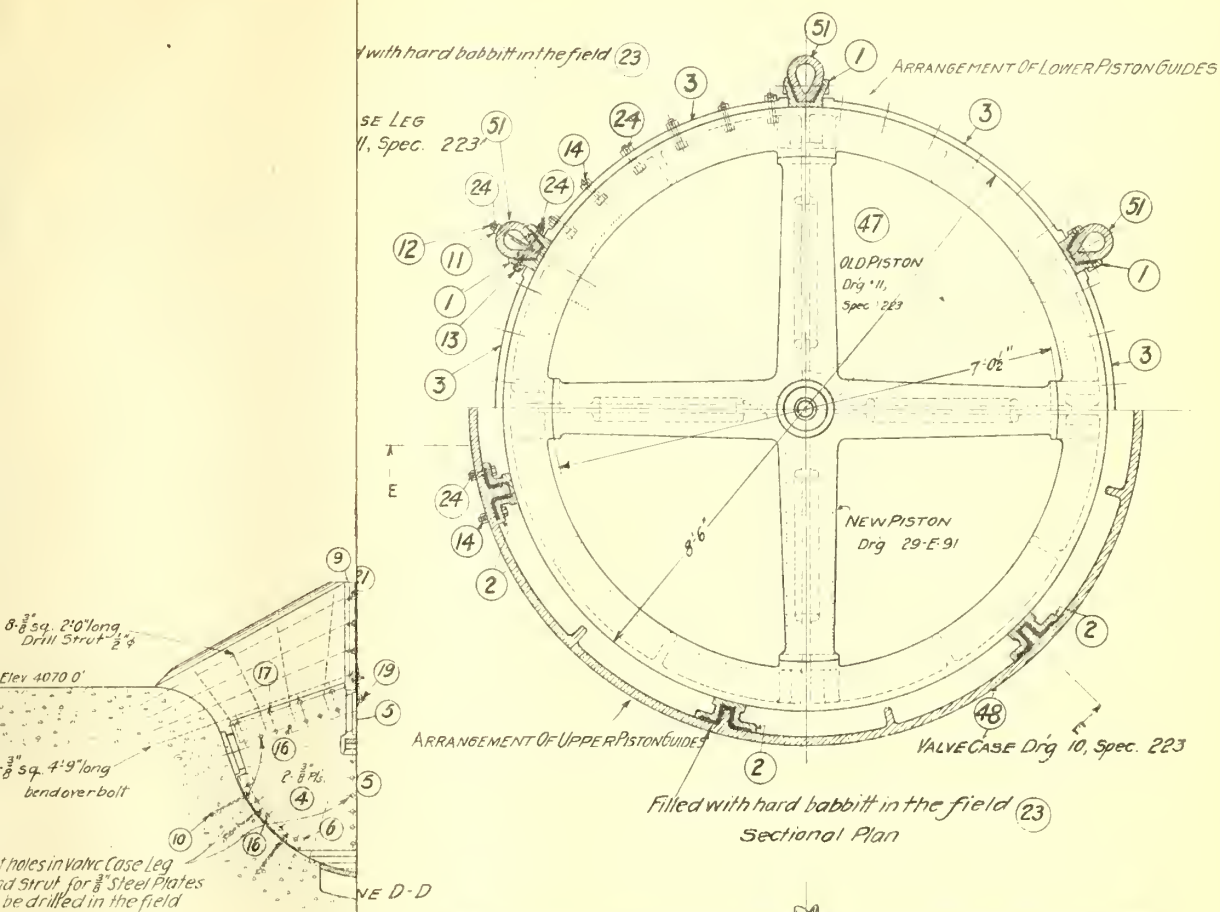
CAST IRON

(Cylindrical Valve and Slide Gates)

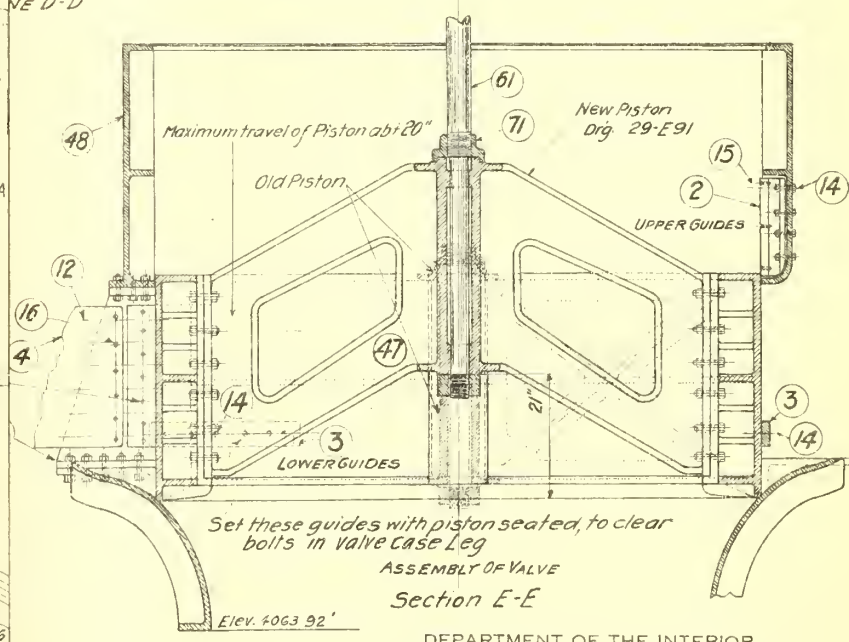
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NEWLANDS IRRIGATION PROJECT NEVADA
LAHONTAN DAM
CYLINDRICAL VALVE AND SLIDE GATES

NO. 20407 PLATE 67 OF 88
1923





Sectional Elevation at A



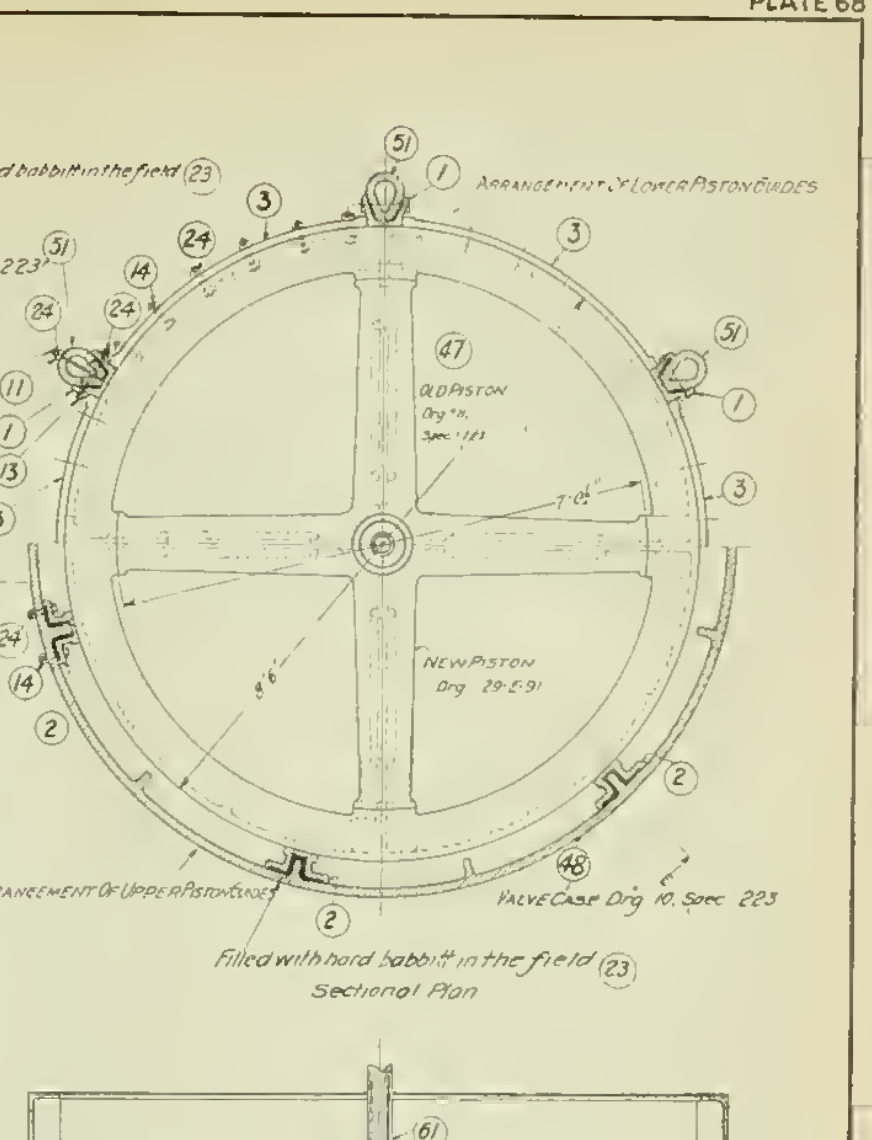
12' 9' 6' 3' 0'

SCALE

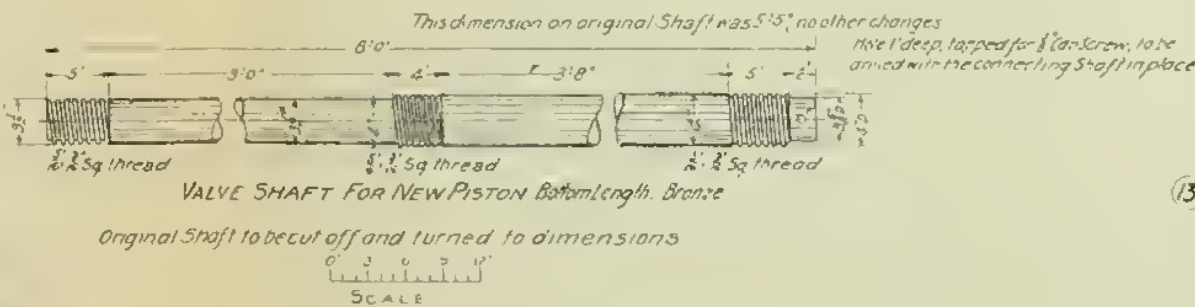
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NEWLANDS IRRIGATION PROJECT, NEVADA

LAHONTAN DAM GUIDE ALTERATIONS IN CYLINDRICAL VALVE

NO. 20408 PLATE 68 OF 88
1923



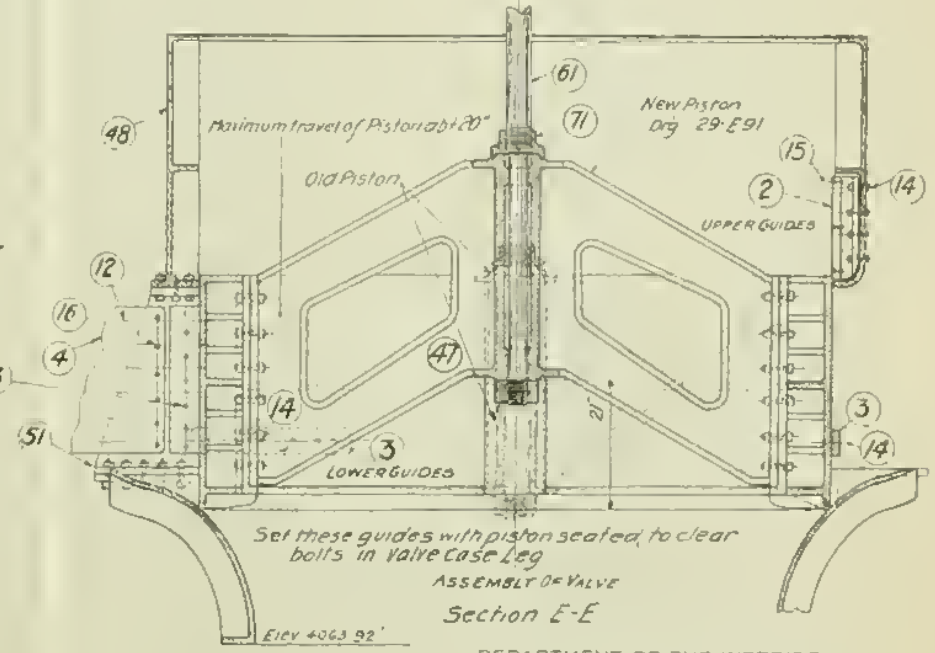
SIDE ELEVATION AT 'B'



VALVE SHAFT FOR NEW PISTON Bottom Length. Bronze

Original Shaft to be cut off and turned to dimensions

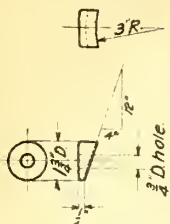
SCALE




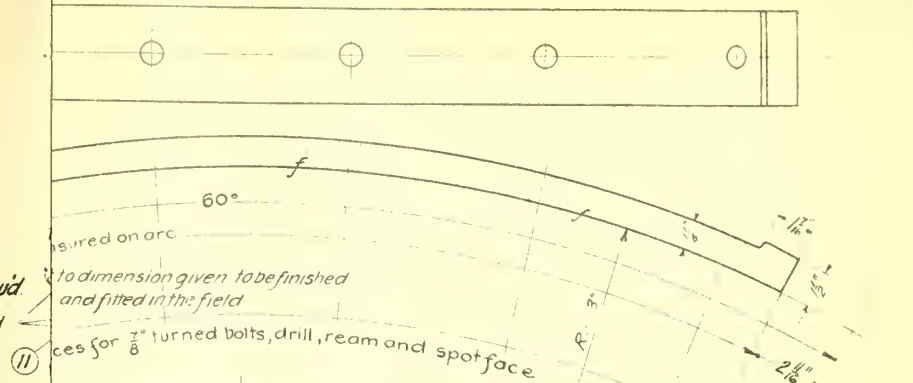
ASSEMBLY OF VALVE

Section E-E

62 92
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NEWLANDS IRRIGATION PROJECT, NEVADA
LAHONTAN DAM
GUIDE ALTERATIONS IN CYLINDRICAL VALVE
NO 20406 PLATE 68 OF 88
1923

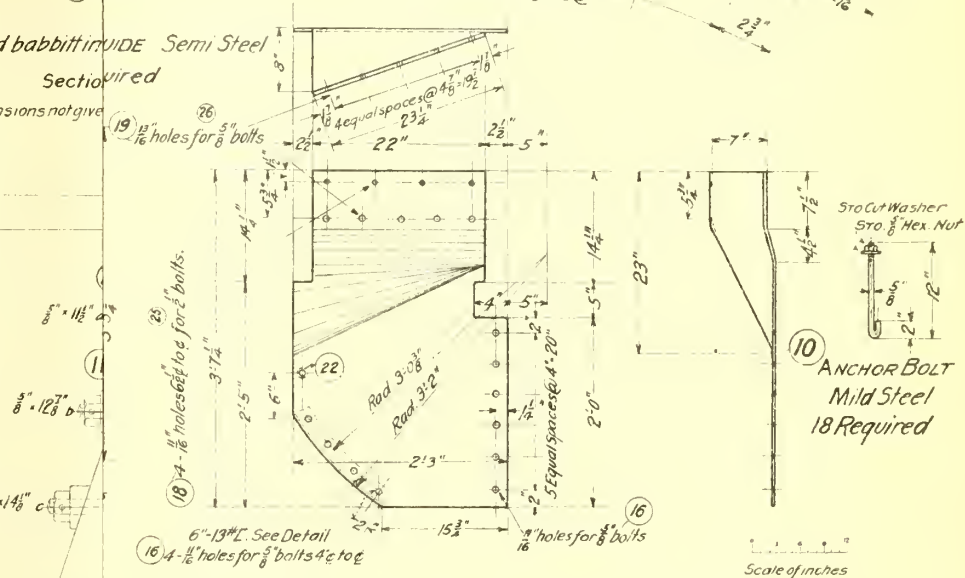


11  **BEVEL WASHER.** Cast Iron. 36 Required.
Cast to dimensions given, to be finished
and fitted in field.



Filled with hard babbitt in UDE Semi Steel
Section wired

For notes and dimensions not given

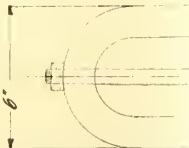


(5) $\frac{3}{8}$ " STEEL PLATE 4 Required. Bend 2 as shown 2 opposite

MATERIAL FOR ONE VALVE:		
DESCRIPTION	SIZE	MAT'L.
Drive Case Leg Guide	As shown	Stainless Steel
Drive Case Guide	"	"
Extension Guide	"	"
Plates	3/8"	Steel
"	"	"
Channels	6" - 13"	"
"	"	"
Angle	4" x 3" x 3/8"	"
Angles	3" x 3" x 1/2"	"
Anchor bolts with hex nut, cut washer	As shown	Mild Steel
Level Washers	3/8" x 1 1/2"	Cut Iron
Counter sunk head bolts with Standard Hex. Nuts	3/8" x 1 1/2"	Mild St.
"	3/8" x 12 1/2"	"
"	3/8" x 14 1/2"	"
"	3/8" x 15 1/2"	"
"	3/8" x 16 1/2"	"
"	3/8" x 18 1/2"	"
Nuts, Hex. Heads and Nuts.	3/8" x 8 1/2"	"
"	3/8" x 3 1/2"	"
Flathead Screws	3/8" x 2"	Bronze
Flat bolts Sq. Heads, Hex. Nuts	3/8" x 2"	Mild St.
"	1/4" x 7 1/2"	"
Boards, threaded both ends.	1/4" x 22 1/2"	"
2 Hex Nuts For each.	1/4" x 19"	"
Threads 2' long	1/4" x 14 1/2"	"
"	1/4" x 12"	"
Boards, threaded both ends	3/4" x 20 1/2"	"
2 Hex. Nuts for each.	3/4" x 19 1/2"	"
Threads 2' long	3/4" x 16 1/2"	"
"	3/4" x 12 1/2"	"
"	3/4" x 10 1/2"	"
Machine bolts, Sq. Heads, Hex Nuts	1/4" x 2 1/2"	"
"	3/8" x 2 1/2"	"
"	3/8" x 6"	"
Tube Spacer	"	"
Ord. Babbitt	"	"
Coarse Spring Wire	1/8 Round	"
Level Washers For 6" Rods, Cast Iron	As shown	"

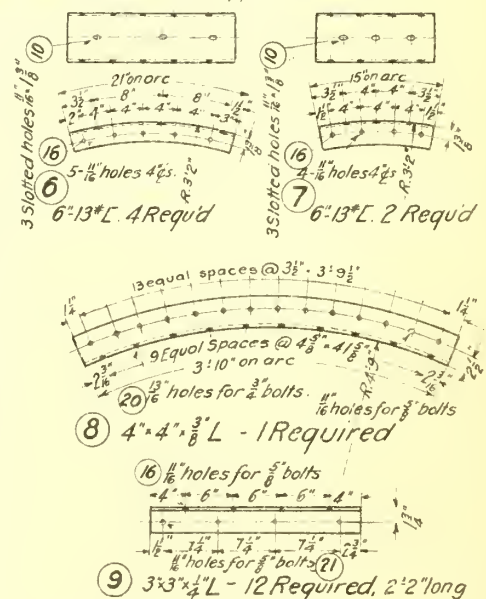
VALVE CASE LEG (SI) Dr'g II Specification 223

Drill and spot face for $\frac{5}{8}$ " turned b



Cast to dimension given, to be finished
and fitted in field

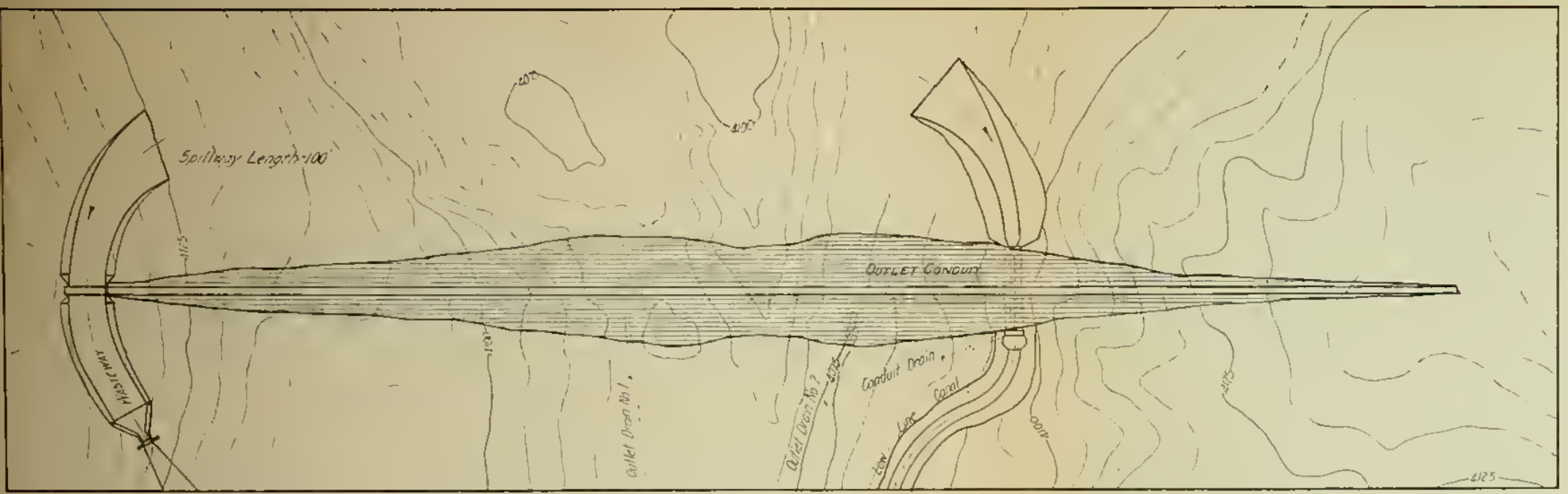
Section B-B



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NEWLANDS IRRIGATION PROJECT, NEVADA
LAHONTAN DAM
DETAILS OF GUIDE ALTERATIONS

DETAILS OF GUIDE ALTERATIONS

NO 20409 PLATE 69 OF 88
1923



PLAN OF MINATARE DAM

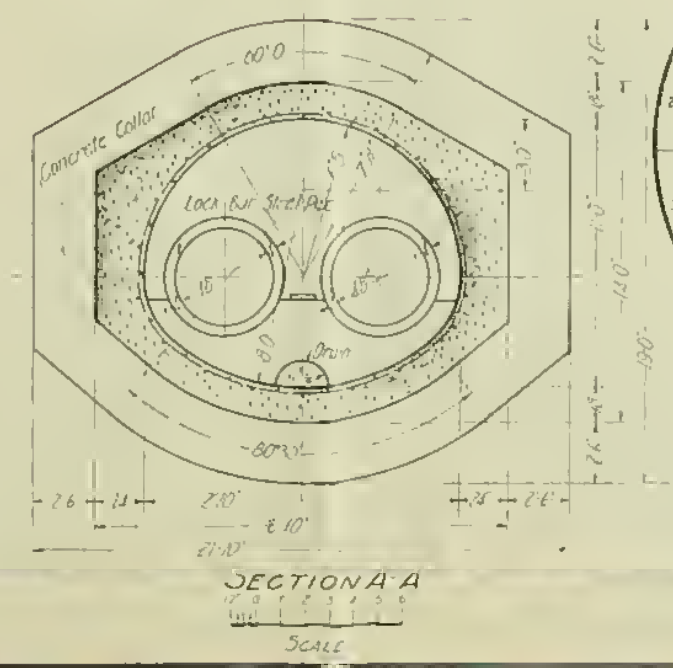
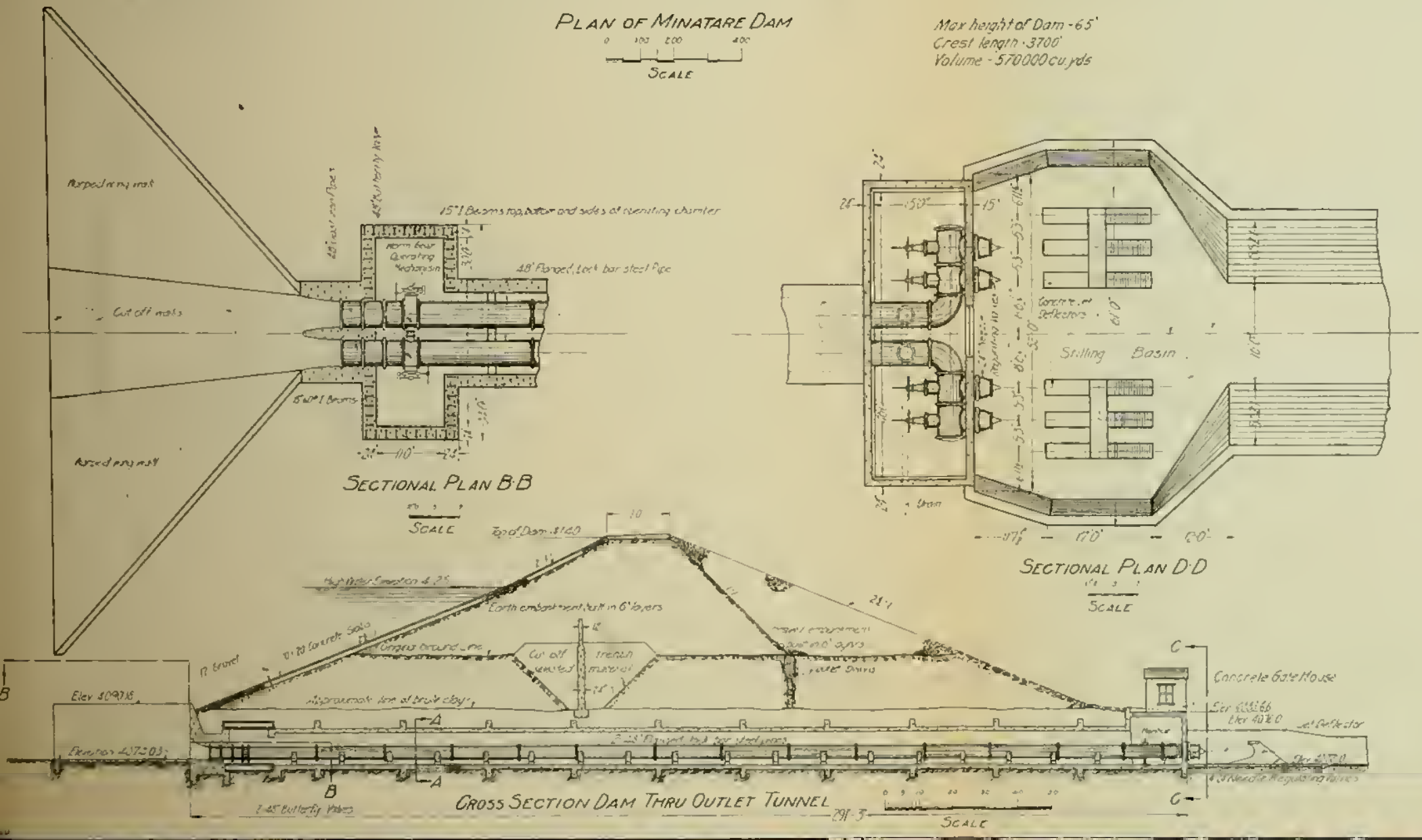
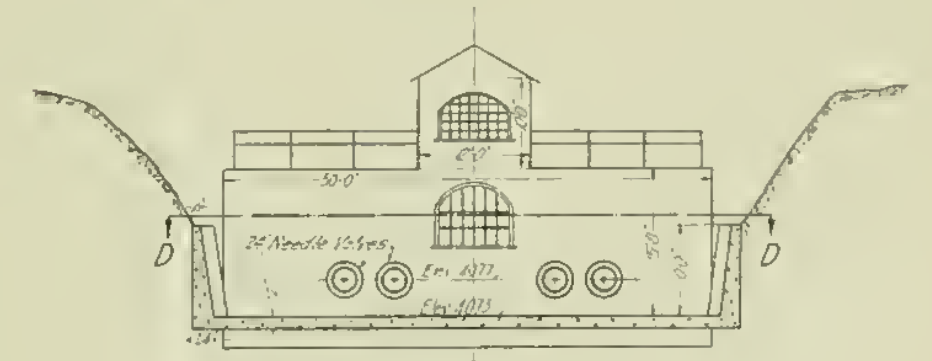
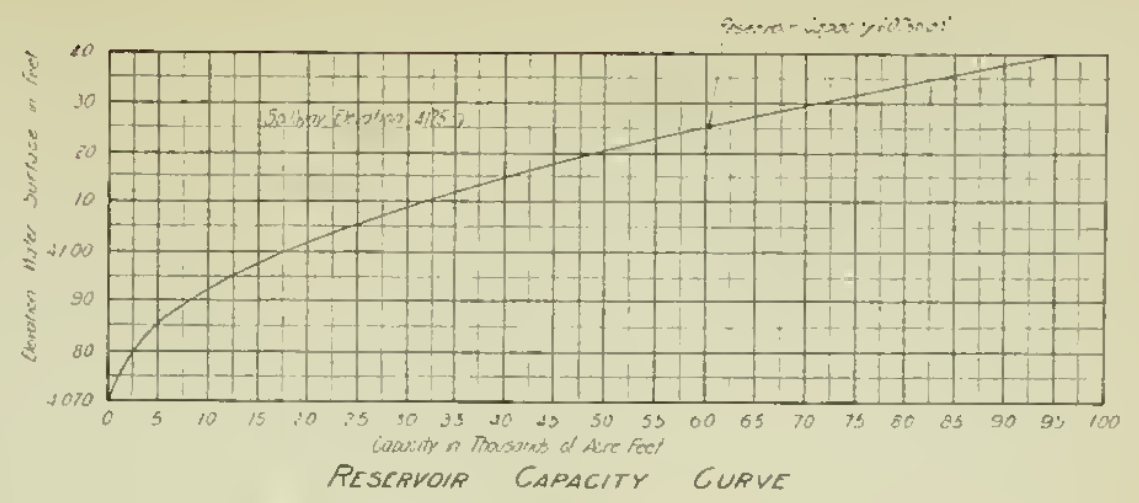
0 100 200 400

SCALE

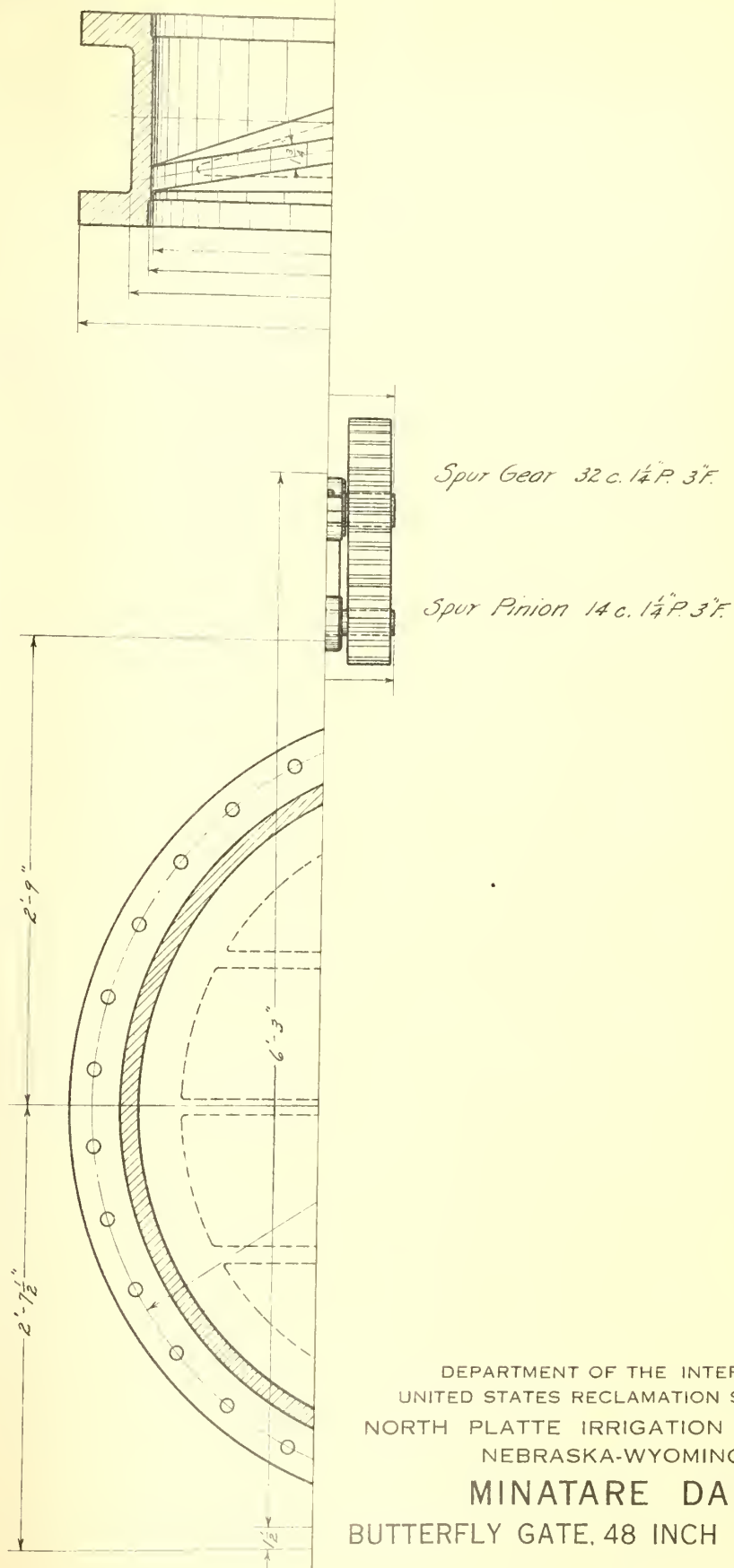
Max height of Dam - 65'

Crest length - 3700'

Volume - 570000 cu. yds



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NORTH PLATTE IRRIGATION PROJECT
NEBRASKA-WYOMING
MINATARE DAM
PLAN AND SECTIONS
NO 20410 PLATE 70 OF 88
1923

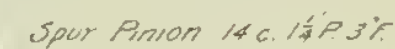


DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NORTH PLATTE IRRIGATION PROJECT
NEBRASKA-WYOMING
MINATARE DAM
BUTTERFLY GATE, 48 INCH DIAMETER

NO. 20411 PLATE 71 OF 88

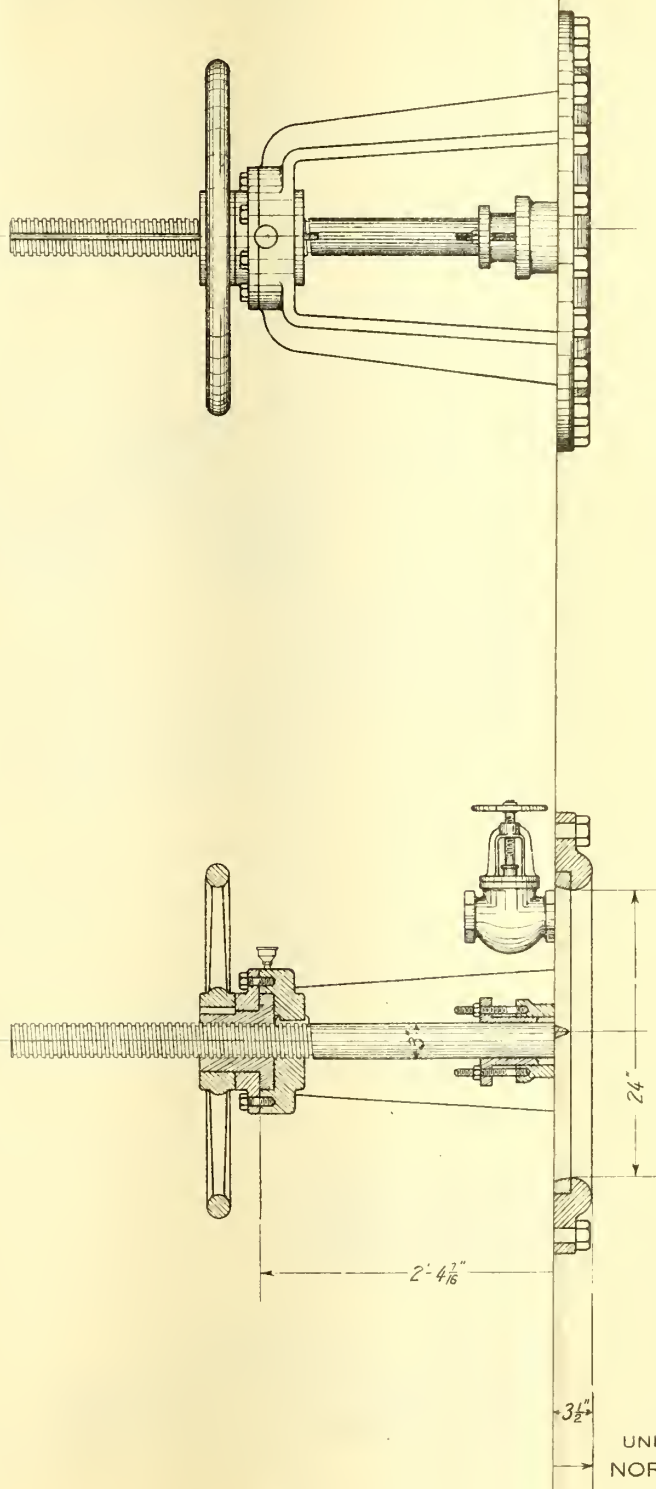
1923

20-M-28



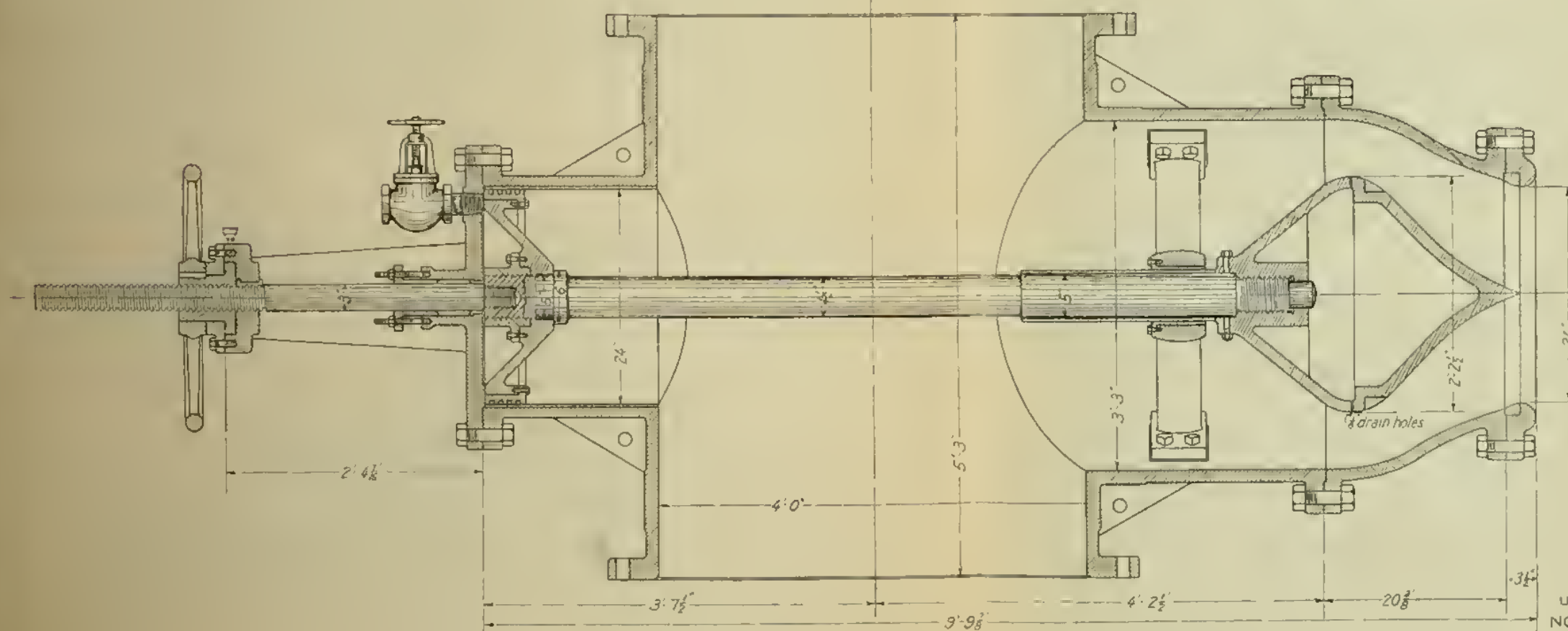
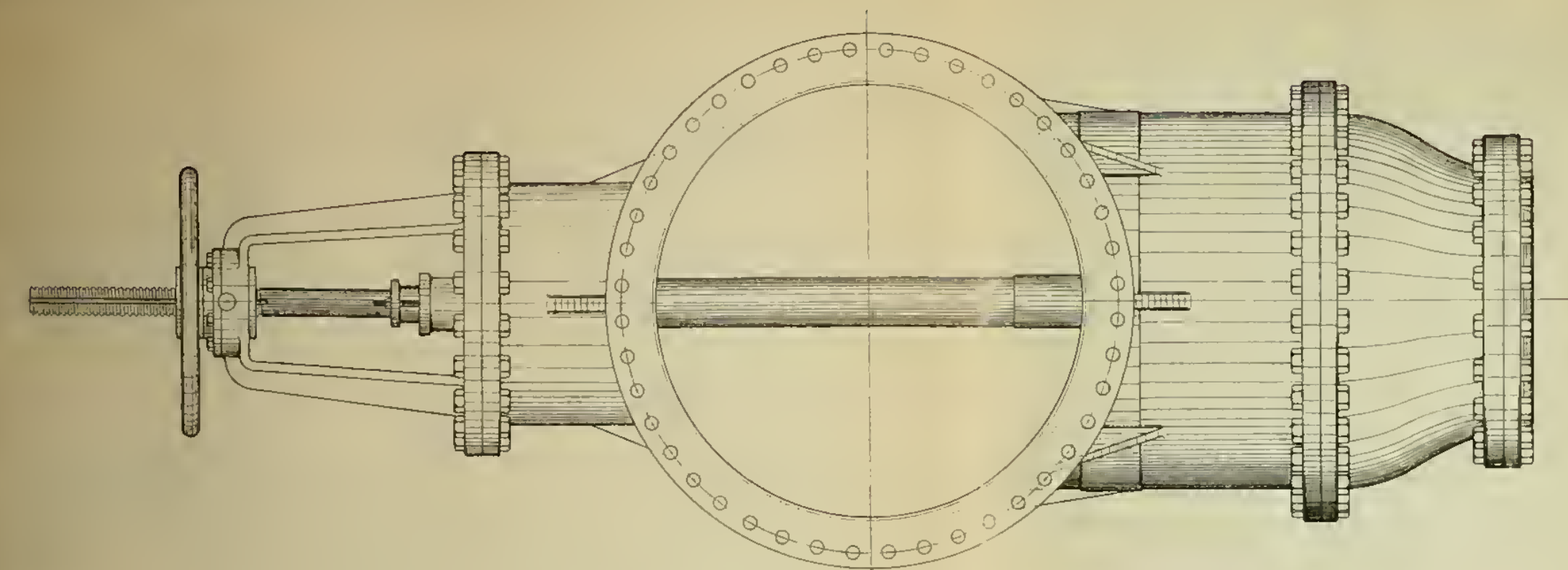
Compression Grease Cups

20-M-28



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NORTH PLATTE IRRIGATION PROJECT
NEBRASKA-WYOMING
MINATARE DAM
GATE REGULATING VALVE 24 INCH DIAMETER

NO. 20412 PLATE 72 OF 87
1923

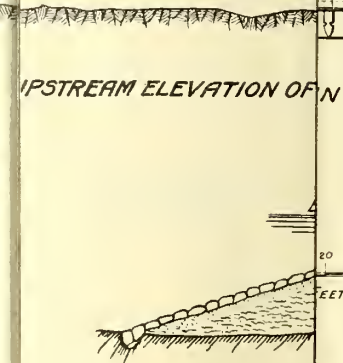


12' 0' 1' 2'
SCALE

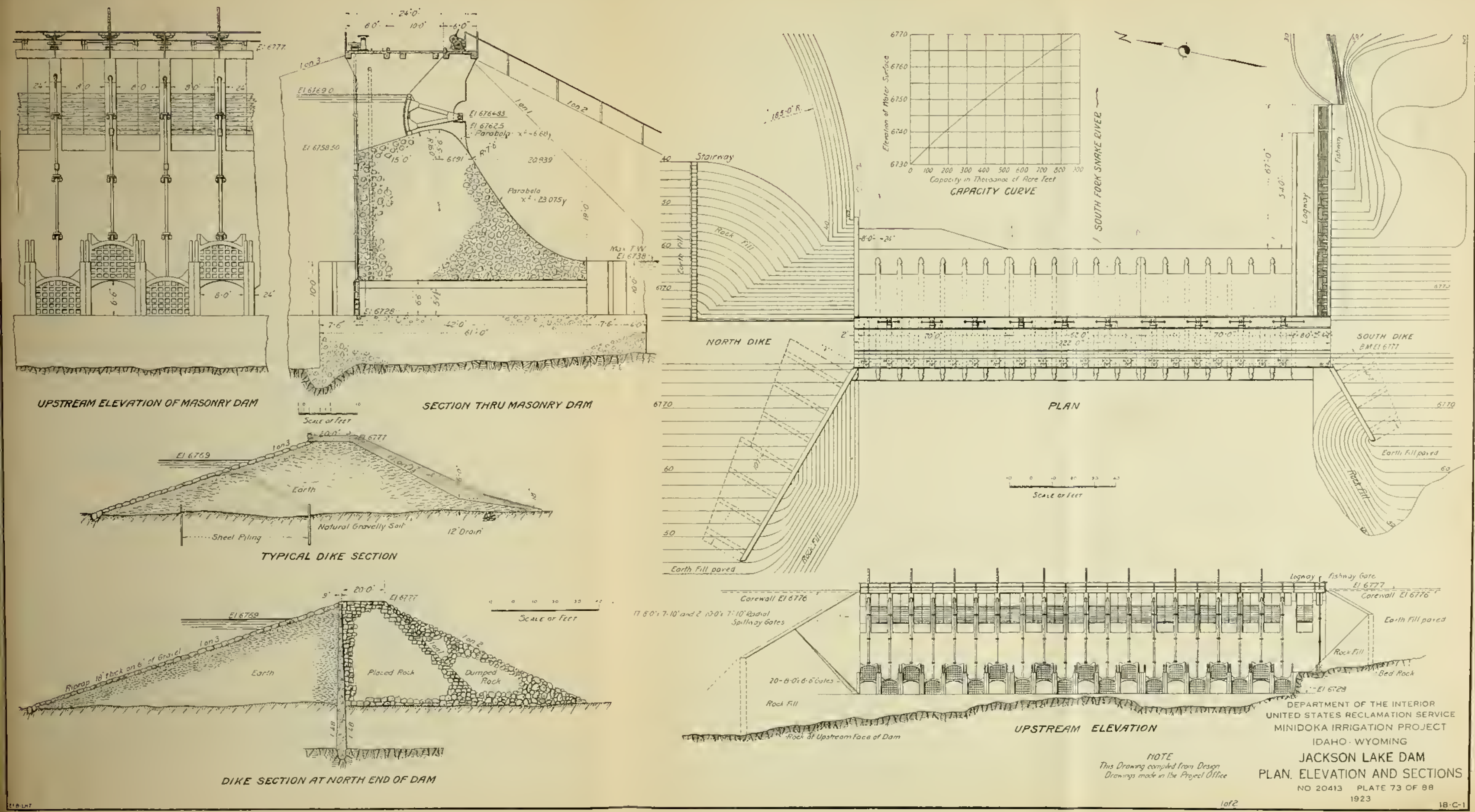
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
NORTH PLATTE IRRIGATION PROJECT
NEBRASKA · WYOMING

MINATARE DAM
NEEDLE REGULATING VALVE 24 INCH DIAMETER

NO 20412 PLATE 72 OF 87
1923

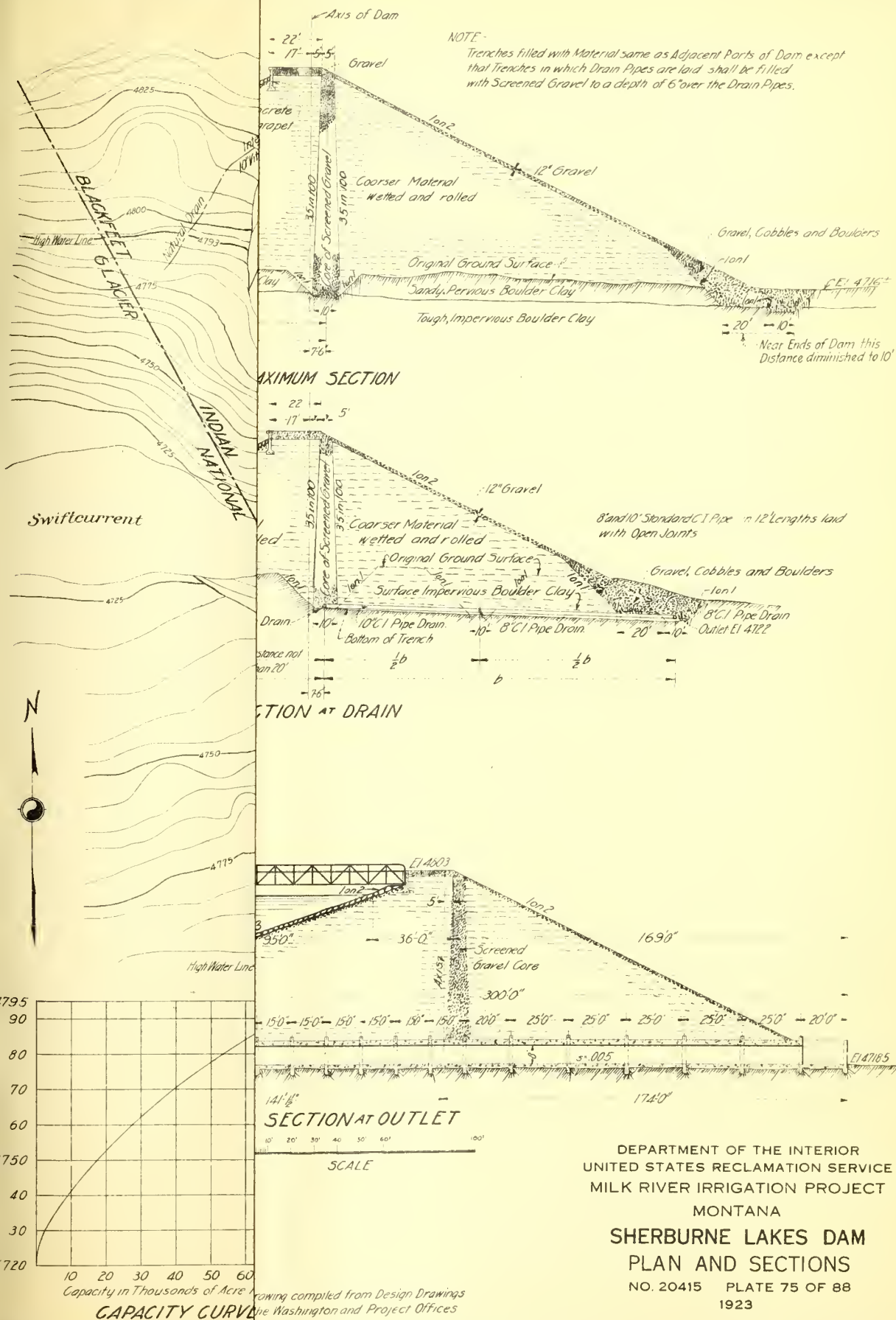


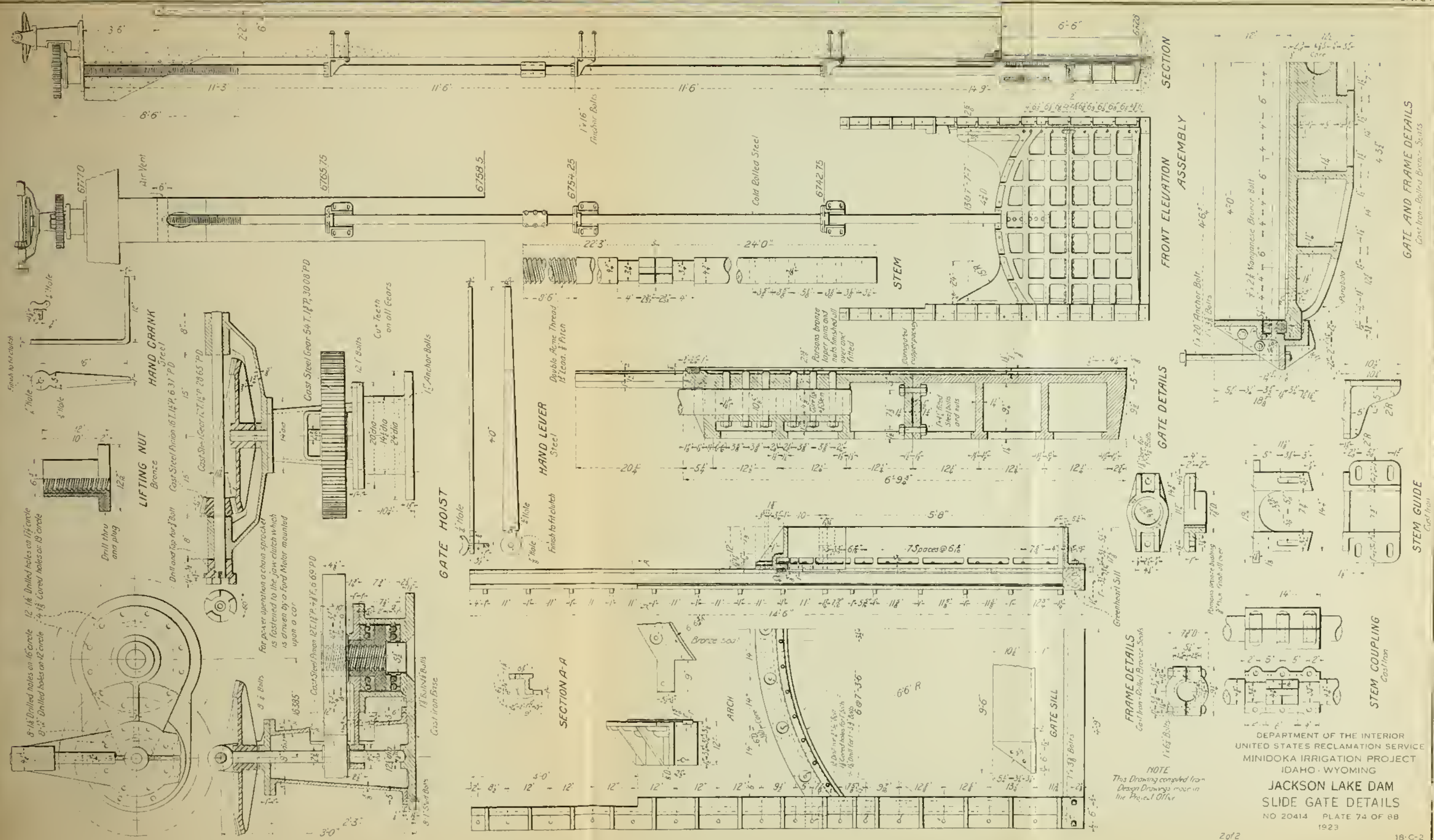
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
MINIDOKA IRRIGATION PROJECT
IDAHO - WYOMING
JACKSON LAKE DAM
PLAN, ELEVATION AND SECTIONS

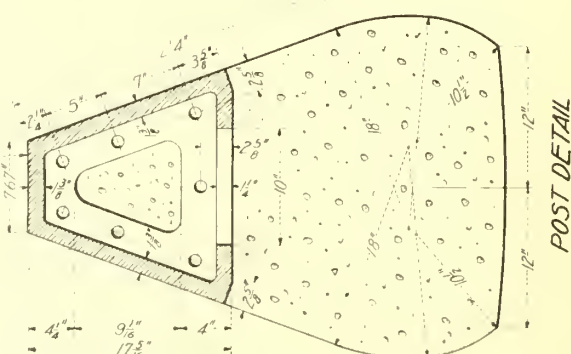


DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
MINIDOKA IRRIGATION PROJECT
IDAHO - WYOMING
JACKSON LAKE DAM
PLAN, ELEVATION AND SECTIONS
NO 20413 PLATE 73 OF 88
1923

NOTE
This Drawing compiled from Design
Drawings made in the Project Office

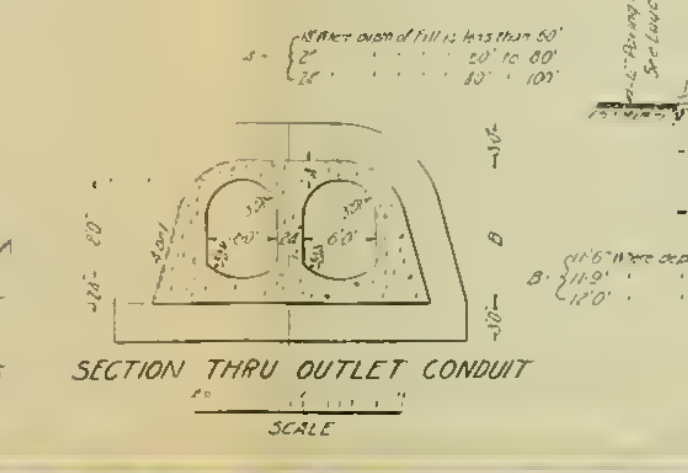
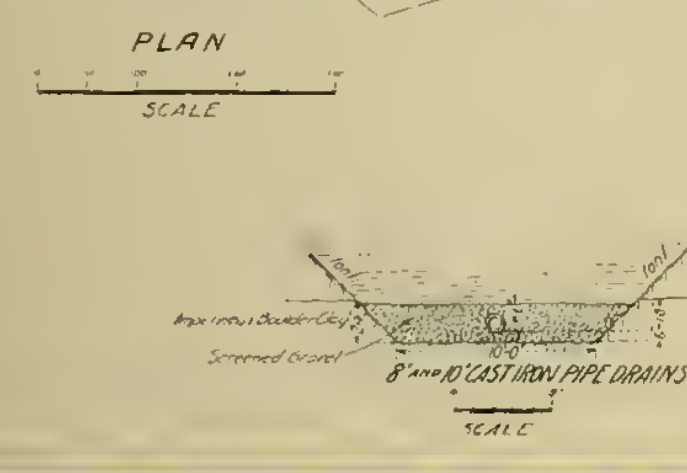
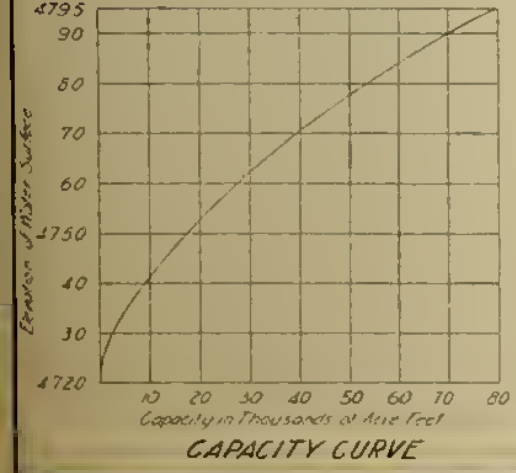
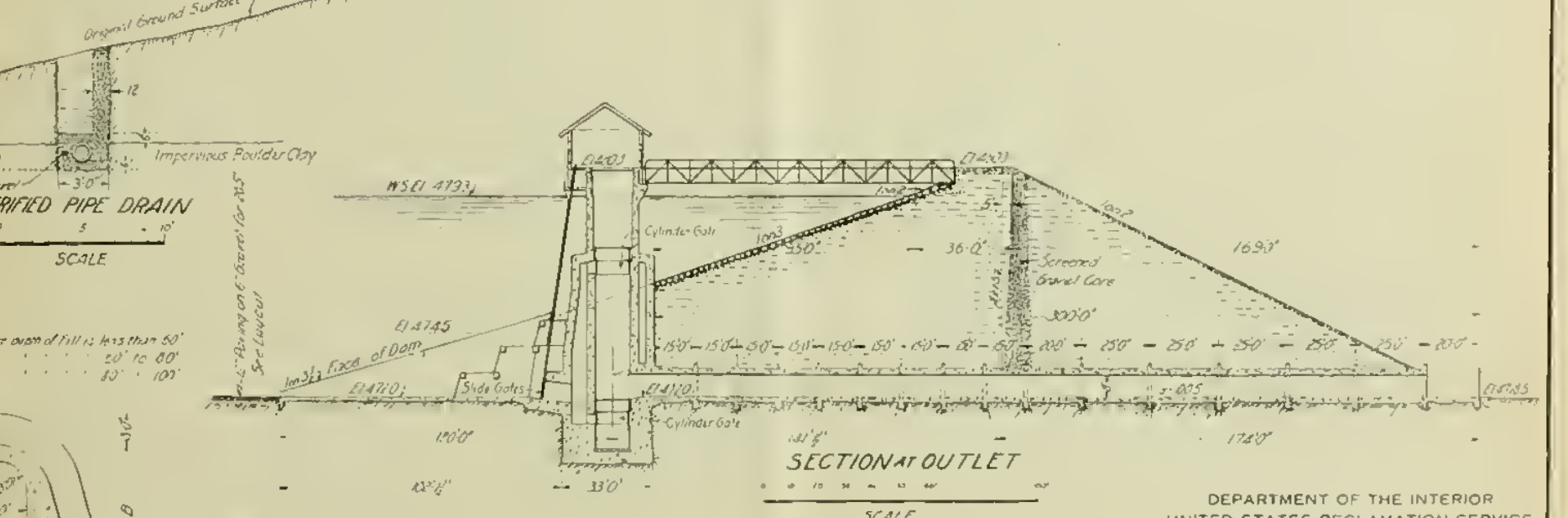
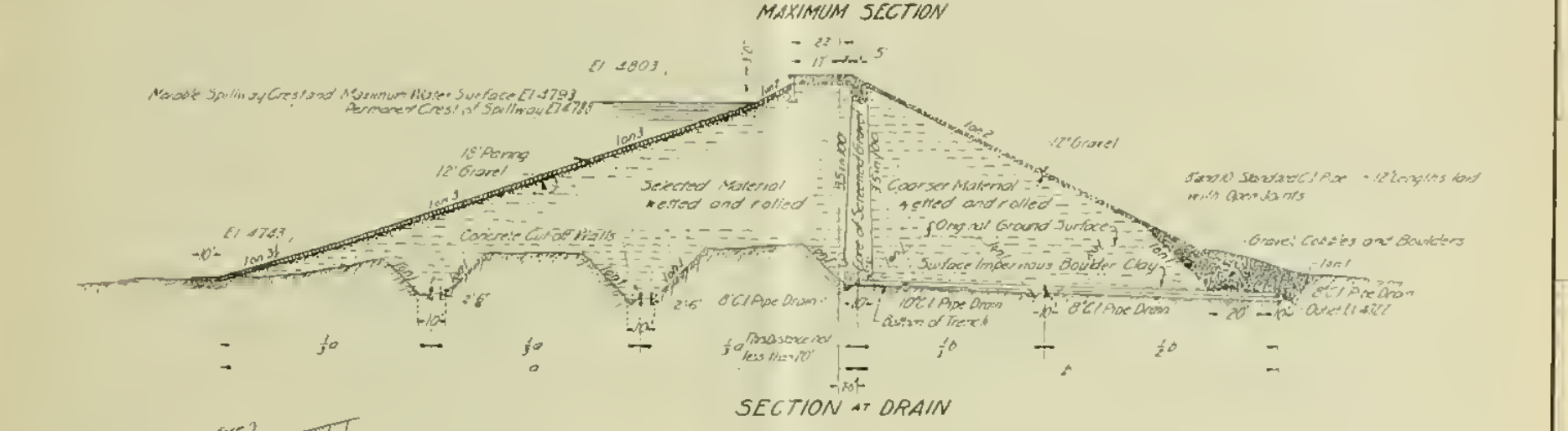
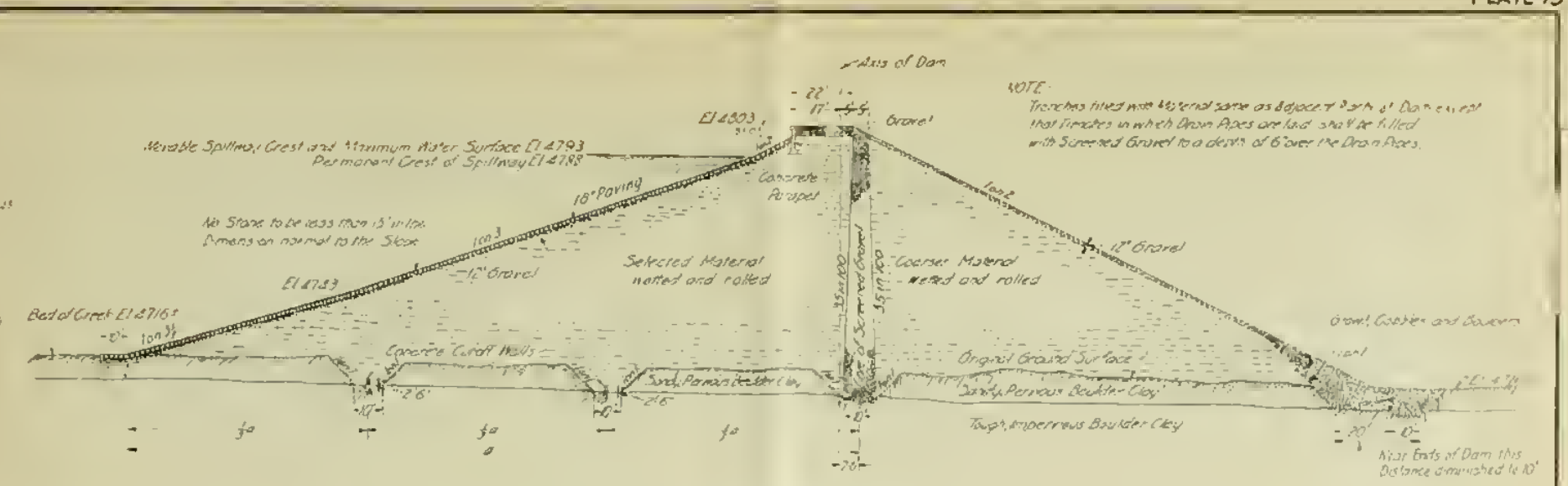
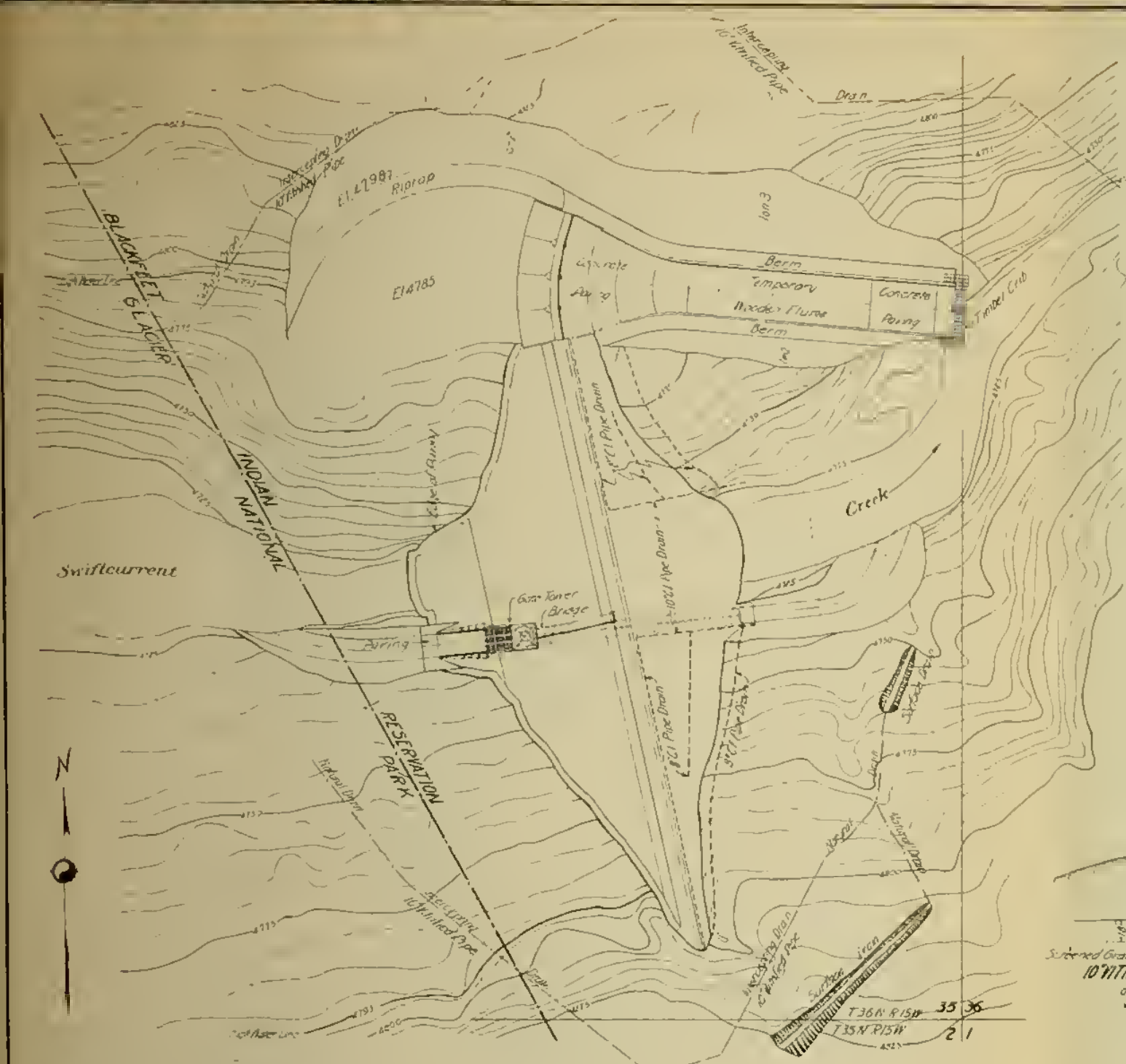






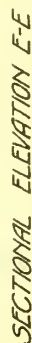
SHERBURNE LAKES DAM
GATE TOWER, ELEVATION AND SECTIONS

2 of 6



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
MILK RIVER IRRIGATION PROJECT
MONTANA
SHERBURNE LAKES DAM
PLAN AND SECTIONS
NO 20415 PLATE 75 OF 88
1923

NOTE: This Drawing compiled from Design Drawings made in the Washington and Project Offices



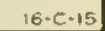
NOTES-

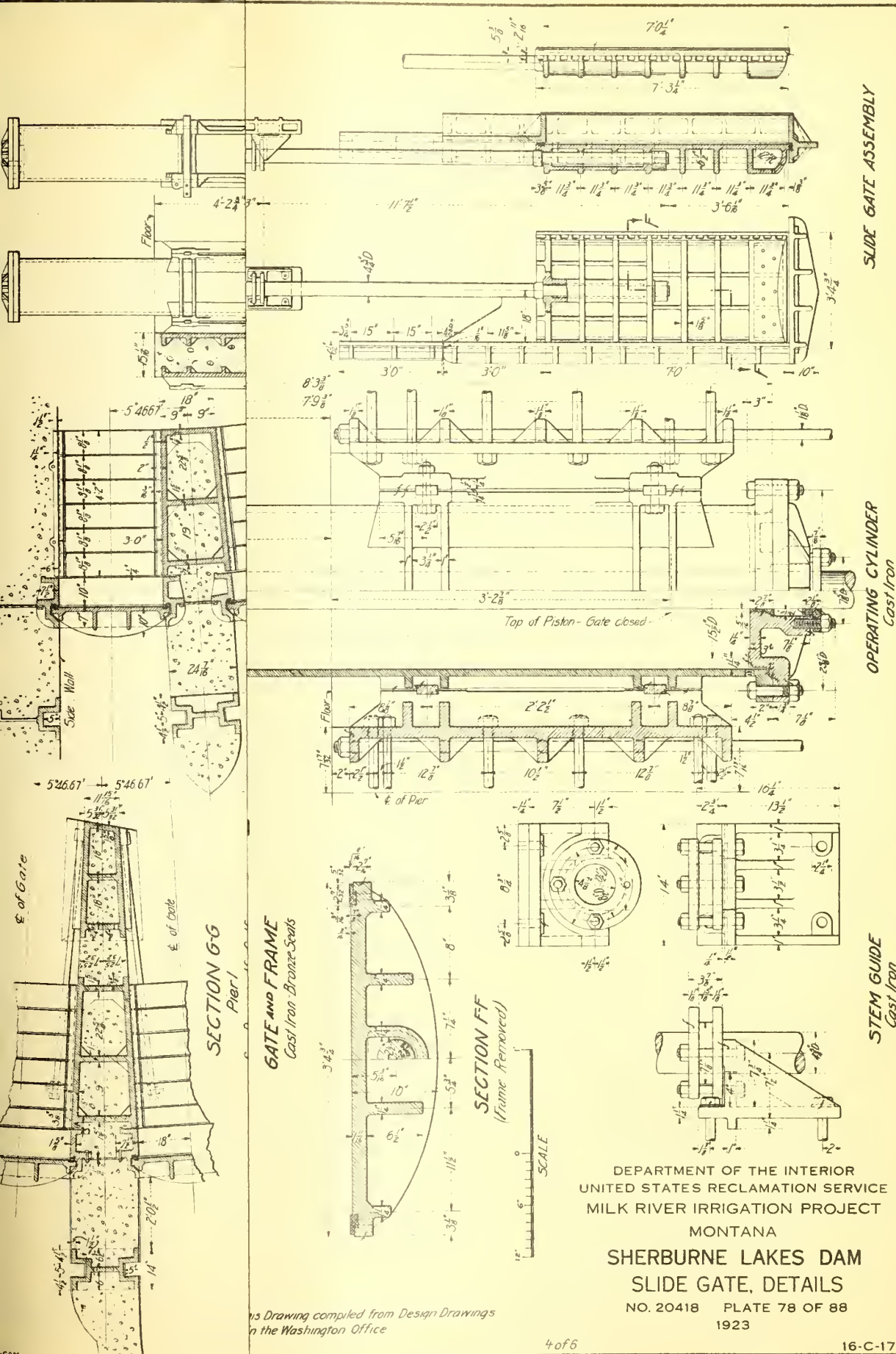
1. Length of three upper Guard Pipes 11'0" Length of lower Guard Pipe on Stem is 15'5".
2. Re-ar Diaphragm extends full height of double Wall. Other Diaphragms extend full height of double Wall with three openings. Lower Opening extends 12 above Sill of ET 4755, middle Opening above Sill of ET 4755 and upper Opening 4 above Sill of ET 4750.
3. Concrete Reinforcement not shown.

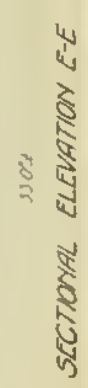
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
MILK RIVER IRRIGATION PROJECT
MONTANA

SHERBURNE LAKES DAM
GATE TOWER, SECTIONS

NO. 20417 PLATE 77 OF 88
1923

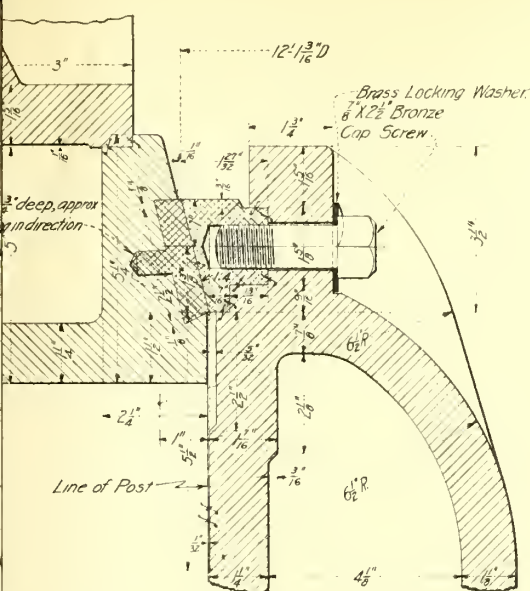






NOTE: This Drawing compiled from Design Drawings made in the Washington and Project Offices

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
MILK RIVER IRRIGATION PROJECT
MONTANA
SHERBURNE LAKES DAM
GATE TOWER, SECTIONS
NO 20417 PLATE 77 OF 88
1923

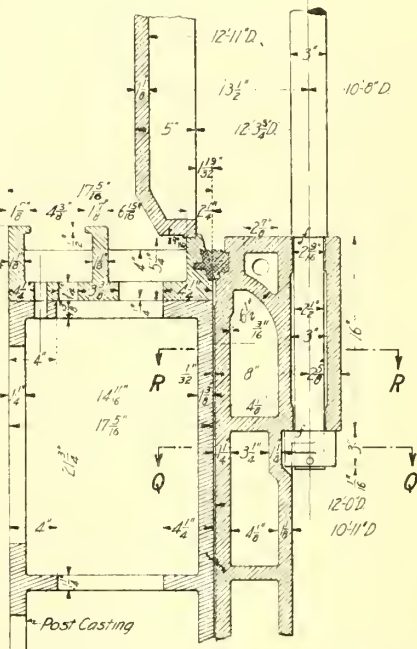


This technical drawing illustrates a mechanical component, likely a bracket or support arm, shown in a cross-sectional view. The part features a curved end with a circular hole and a flat section with a threaded hole. Key dimensions include:

- Diameters:** \$12 \frac{1}{8}"\$ D at the top left, \$10 \frac{7}{8}"\$ D for the main body, and \$12 0"\$ at the bottom.
- Radii:** \$R \frac{1}{2}"\$ at the inner curve and \$R \frac{1}{4}"\$ at the outer edge of the curved section.
- Thicknesses:** \$\frac{1}{2}"\$ for the main body wall and \$\frac{3}{8}"\$ for the flange at the base.
- Assembly Details:** A bolted joint is shown at the base, consisting of a bolt, nut, and washer, securing the component to a vertical plate.

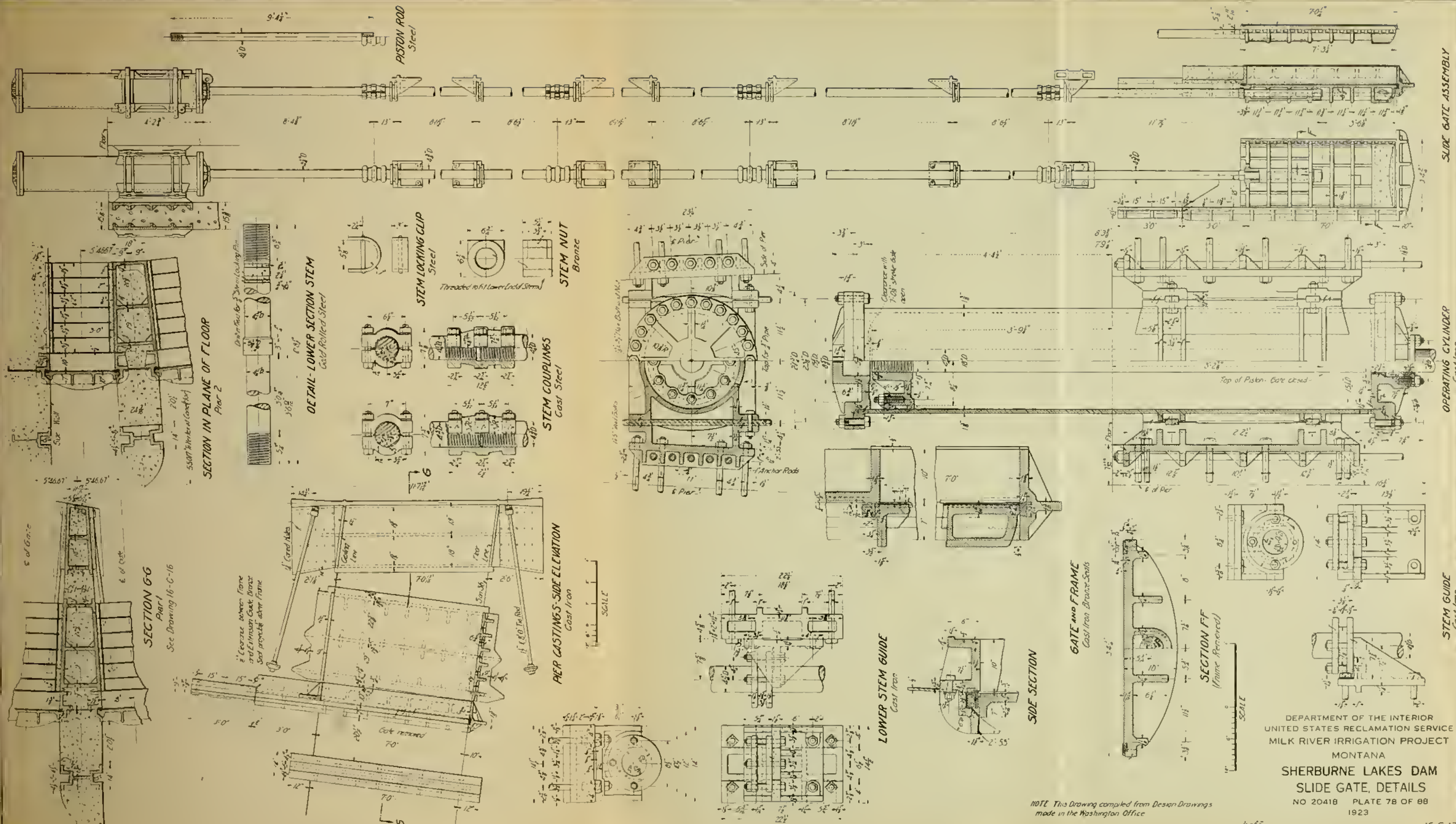
Technical drawing of a mechanical assembly, likely a pump or engine component, showing a cross-section with various dimensions and labels. The drawing includes a vertical shaft on the left with a diameter of $\varnothing 1\frac{1}{8}$ and a horizontal shaft on the right with a diameter of $\varnothing 1\frac{1}{2}$. The vertical shaft has a length of $13\frac{11}{16}$ and a diameter of $\varnothing 1\frac{1}{8}$. The horizontal shaft has a diameter of $\varnothing 1\frac{1}{2}$ and a length of 8 . The assembly is shown in a cross-section view, with various components labeled with letters and numbers. The drawing is a technical illustration of a mechanical assembly, likely a pump or engine component, showing a cross-section with various dimensions and labels. The drawing includes a vertical shaft on the left with a diameter of $\varnothing 1\frac{1}{8}$ and a horizontal shaft on the right with a diameter of $\varnothing 1\frac{1}{2}$. The vertical shaft has a length of $13\frac{11}{16}$ and a diameter of $\varnothing 1\frac{1}{8}$. The horizontal shaft has a diameter of $\varnothing 1\frac{1}{2}$ and a length of 8 . The assembly is shown in a cross-section view, with various components labeled with letters and numbers. The drawing is a technical illustration of a mechanical assembly, likely a pump or engine component, showing a cross-section with various dimensions and labels. The drawing includes a vertical shaft on the left with a diameter of $\varnothing 1\frac{1}{8}$ and a horizontal shaft on the right with a diameter of $\varnothing 1\frac{1}{2}$. The vertical shaft has a length of $13\frac{11}{16}$ and a diameter of $\varnothing 1\frac{1}{8}$. The horizontal shaft has a diameter of $\varnothing 1\frac{1}{2}$ and a length of 8 . The assembly is shown in a cross-section view, with various components labeled with letters and numbers.

Technical drawing of a rectangular object, possibly a box or container, showing dimensions and internal features. The drawing includes a top view and a side view. The top view shows a rectangle with dimensions 1 1/4, 3 1/2, and 1 1/2. The side view shows a rectangle with dimensions 1 1/2, 3 1/2, and 6. The drawing also shows internal compartments and a central opening.



DEPARTMENT OF THE INTERIOR
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MONTANA

NO. 20419 PLATE 79 OF 88
1923



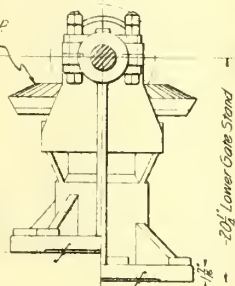
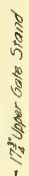
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
MILK RIVER IRRIGATION PROJECT
MONTANA
SHERBURNE LAKES DAM
SLIDE GATE, DETAILS
NO 20418 PLATE 78 OF 88
1923

SLIDE GATE ASSEMBLY

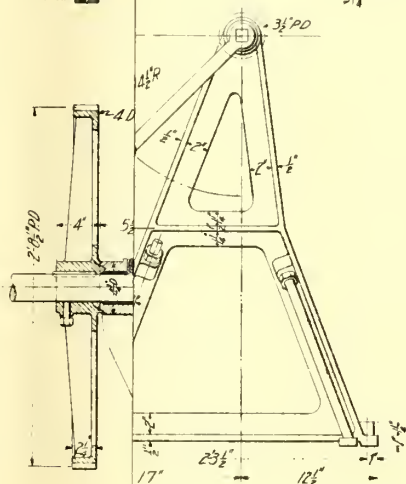
OPERATING CYLINDER

STEM GUIDE

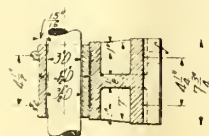
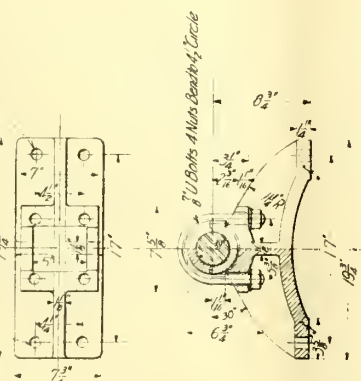
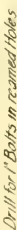
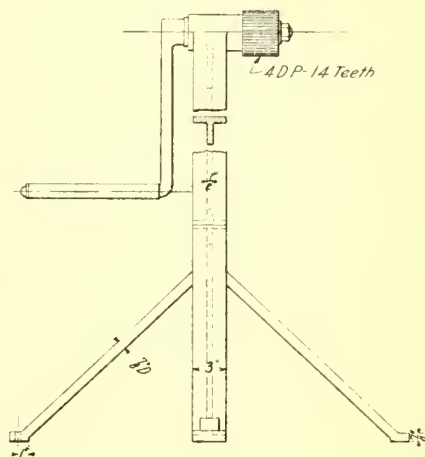
Standard Set Collars on Shafting at Hoists for Stems 3 and 6
Bevel Gears on Shafting at Hoists for Stems 2 and 5 are 4 D.P. 76 Teeth
Threaded Length 5'6" on Stems 1 and 4, 5'0" on Stems 2, 3, 5 and 6
Thread in Lifting Nut Double Acme, $\frac{3}{4}$ " Lead, $\frac{1}{2}$ " Pitch



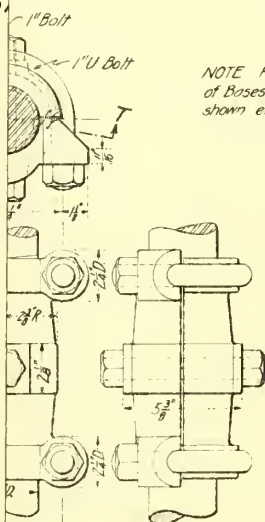
CYLINDER GATE HOIST
Cast Iron



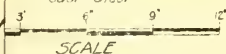
CRANK STAND
Cast Iron



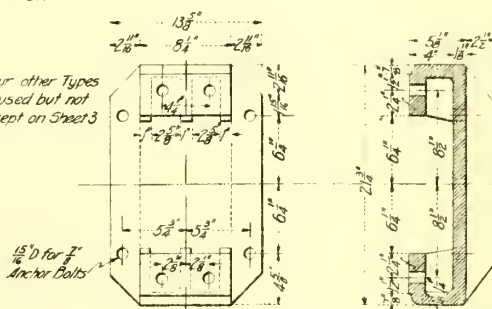
STEM GUIDE AND BRACKETS
Cast Iron



HALFELEVATION
TEM GUIDE COUPLING
(Cast Steel)



NOTE Four other Types of Bases used but not shown except on Sheet 3



BASE FOR STEM GUIDE BRACKET
Cast Iron

NOTE: All Details shown on this Sheet are for
Cylinder Gates.

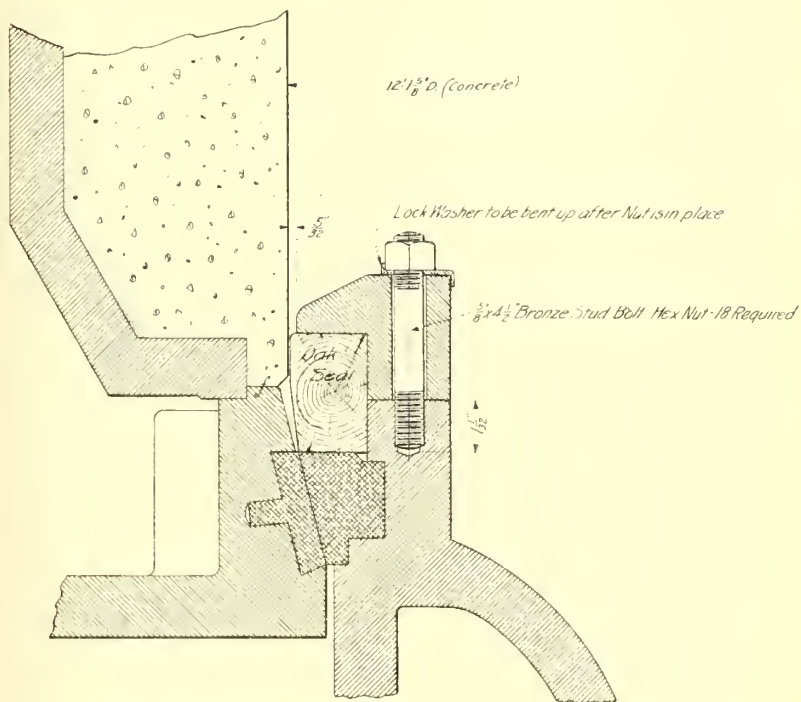
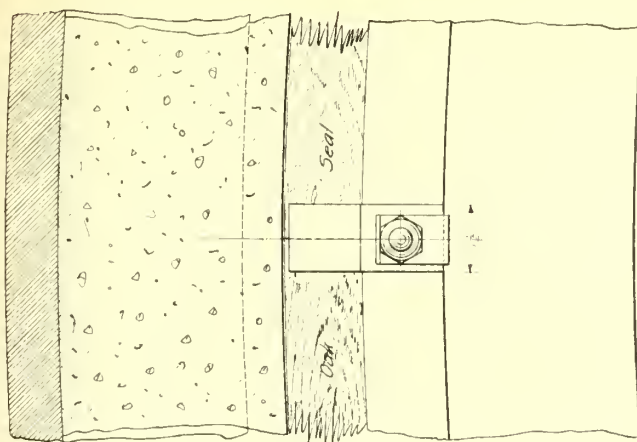
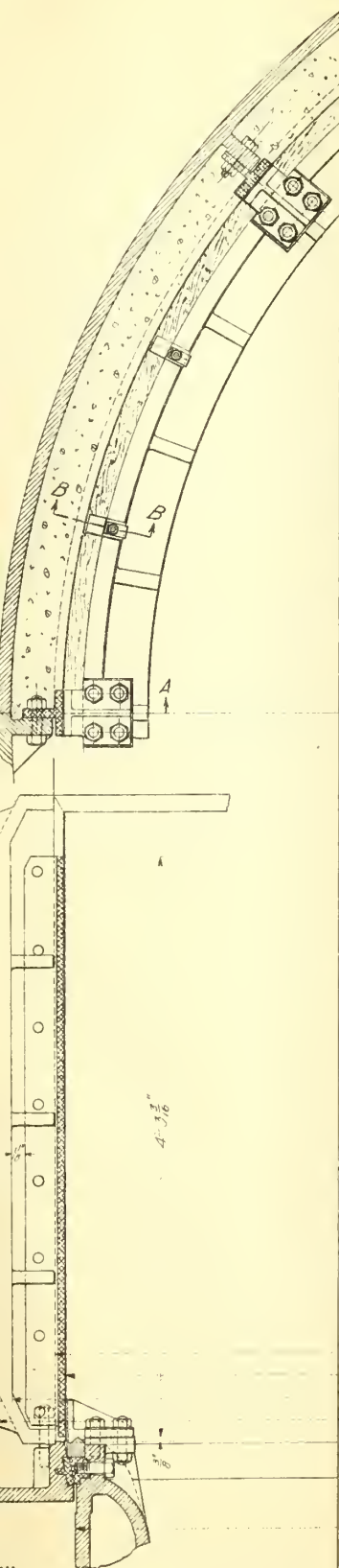
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
MILK RIVER IRRIGATION PROJECT
MONTANA

SHERBURNE LAKES DAM

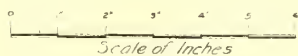
GATE HOISTS

NO. 20420 PLATE 80 OF 88
1923

Drawing compiled from Design Drawings
in Washington Office.



SECTION BB

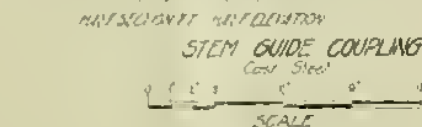
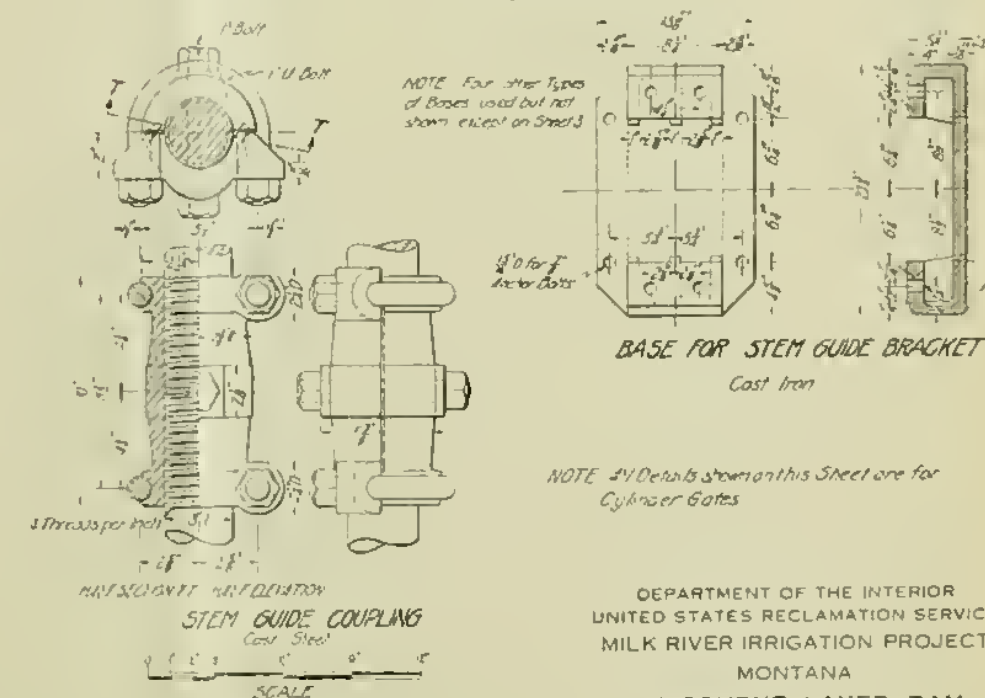
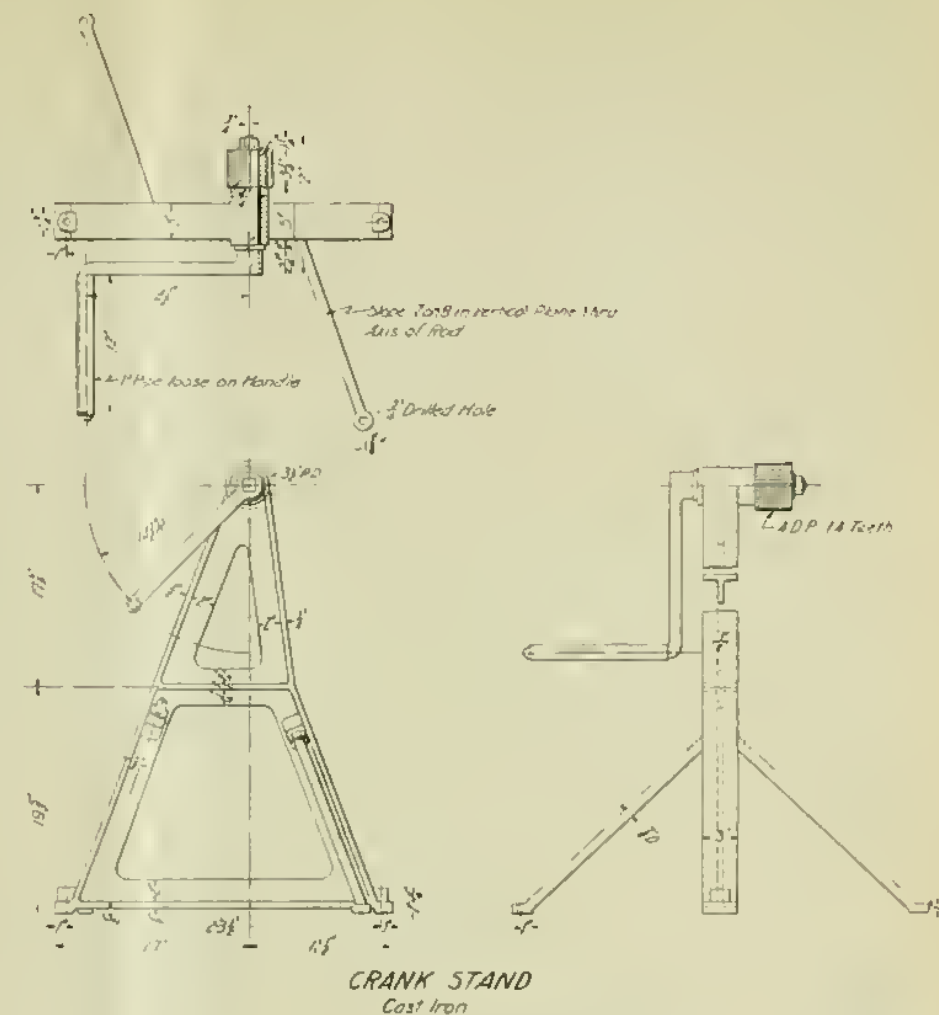
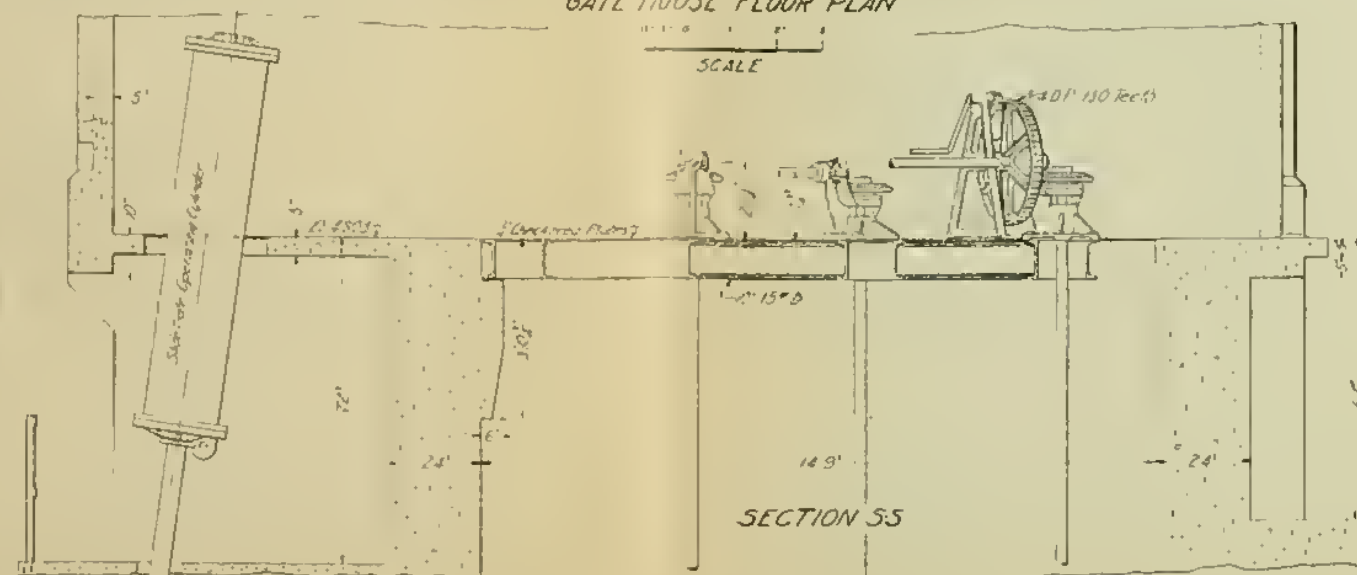
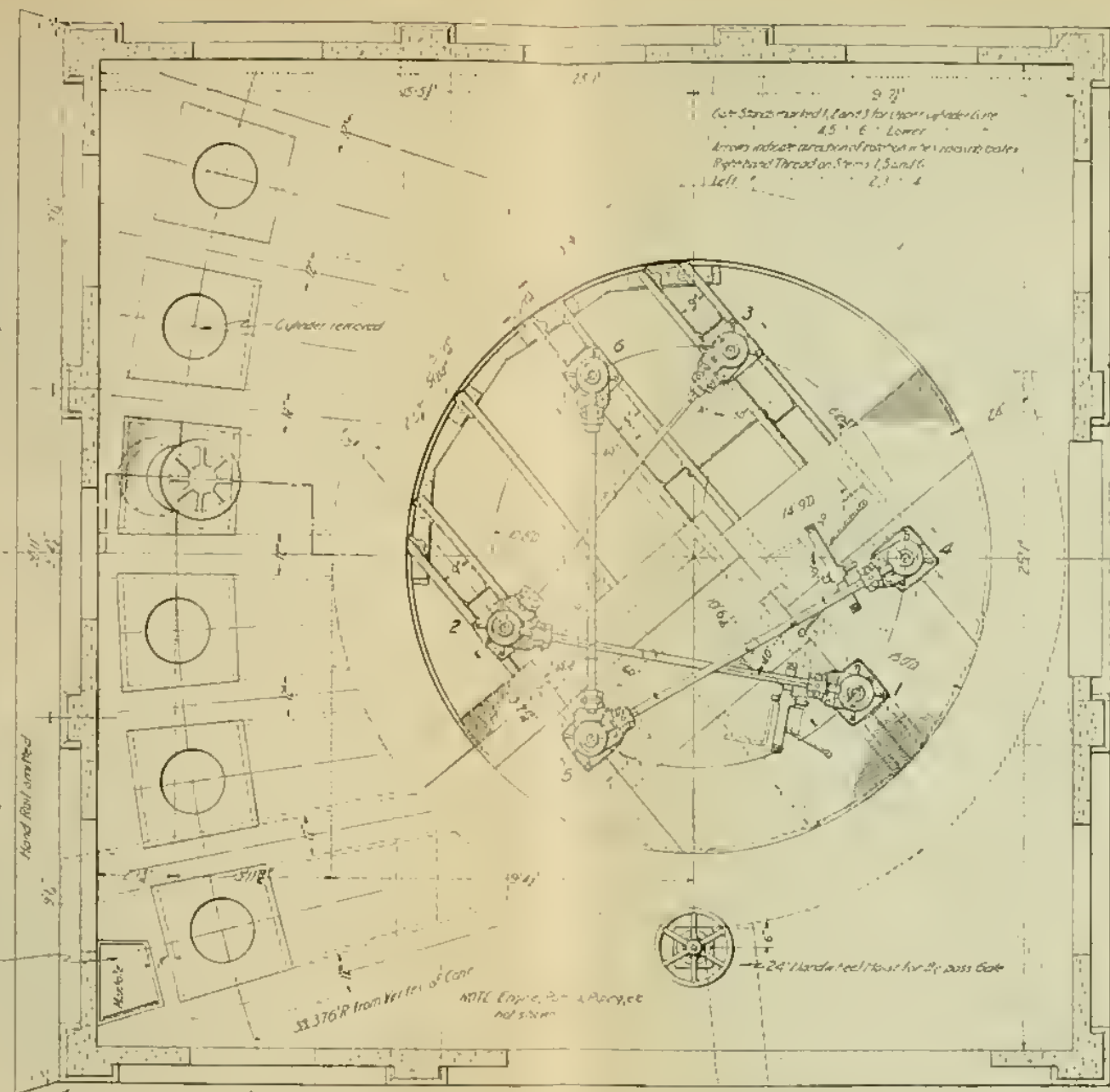
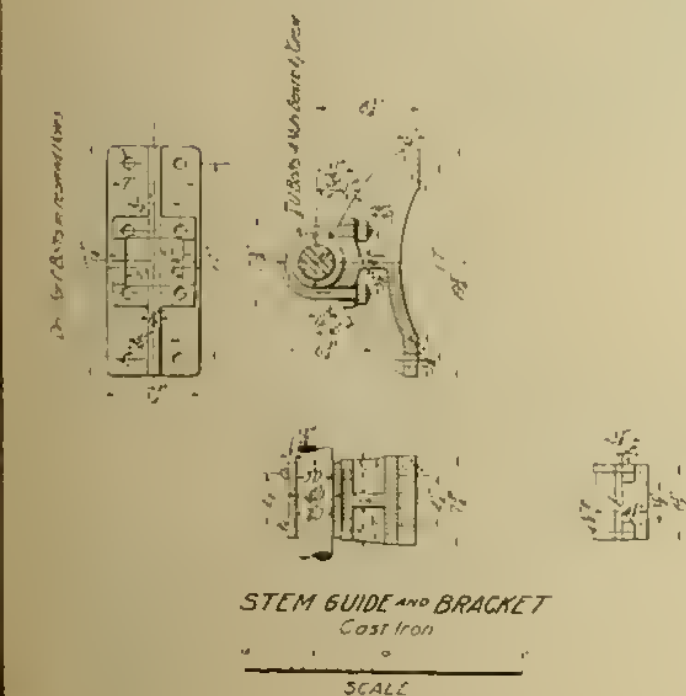
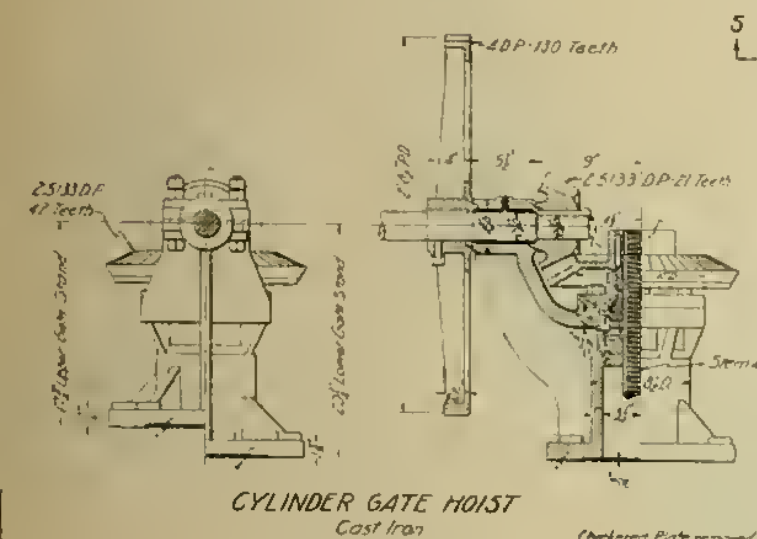


NOTE: Repairs consist of filling the frame with concrete and adding an Oak Sealing Strip to keep gravel off the gate seat which in the past has prevented closing of gate. Additions to be made to the lower Gate only.

DEPARTMENT OF THE INTERIOR
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MILK RIVER IRRIGATION PROJECT, MONTANA
SHERBURNE LAKES DAM
CYLINDER GATE REPAIRS
NO. 20421 PLATE 81 OF 88
1923

NOTES:

Standard Set Collars on Shafting at
Hubs for Stems 3 and 6
Bowl Bearings on Shafting at Hubs for
Stems 2 and 5 are 40 P. 76 Teeth
Threaded Length 5'6" on Stems 1 and 4
5'0" on Stems 2, 3, 5 and 6
Thread in Lifting Nut Double Acme J. 1.5
2" Pitch

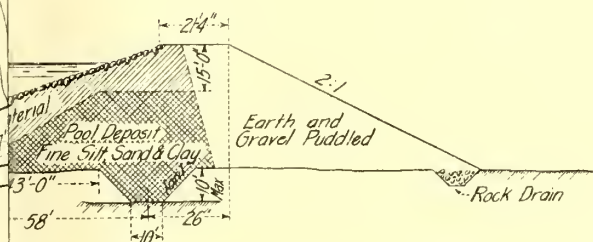
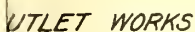


NOTE: This Drawing compiled from Design Drawings
made in the Washington Office

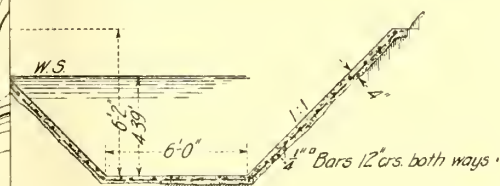
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
MILK RIVER IRRIGATION PROJECT
MONTANA

**SHERBURNE LAKES DAM
GATE HOISTS**

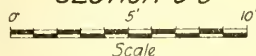
NO 20420 PLATE 80 OF 88
1923



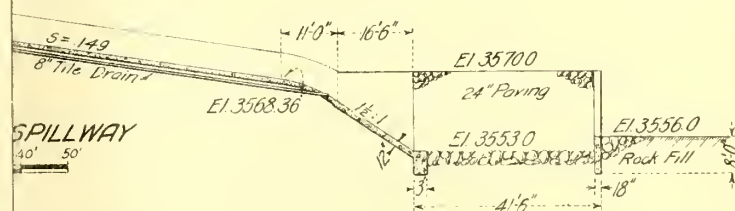
SECTION THROUGH DAM



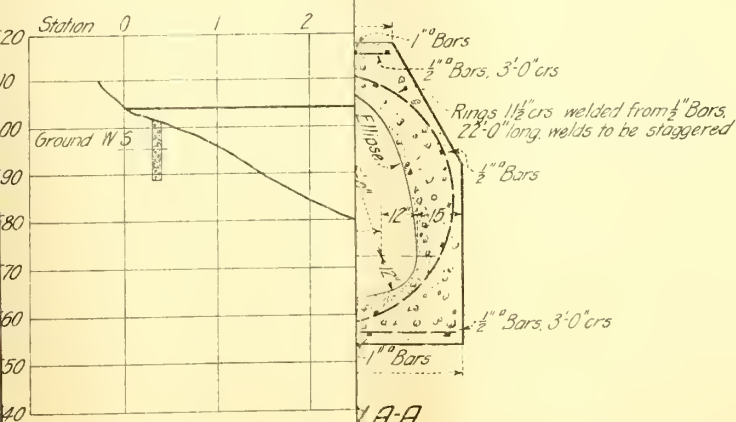
SECTION C-C



Hydraulic Properties
 $n = 0.014$ $S = 0.002$
 $d = 4.39$ $V = 8.78$
 $Q = 400$



SPILLWAY

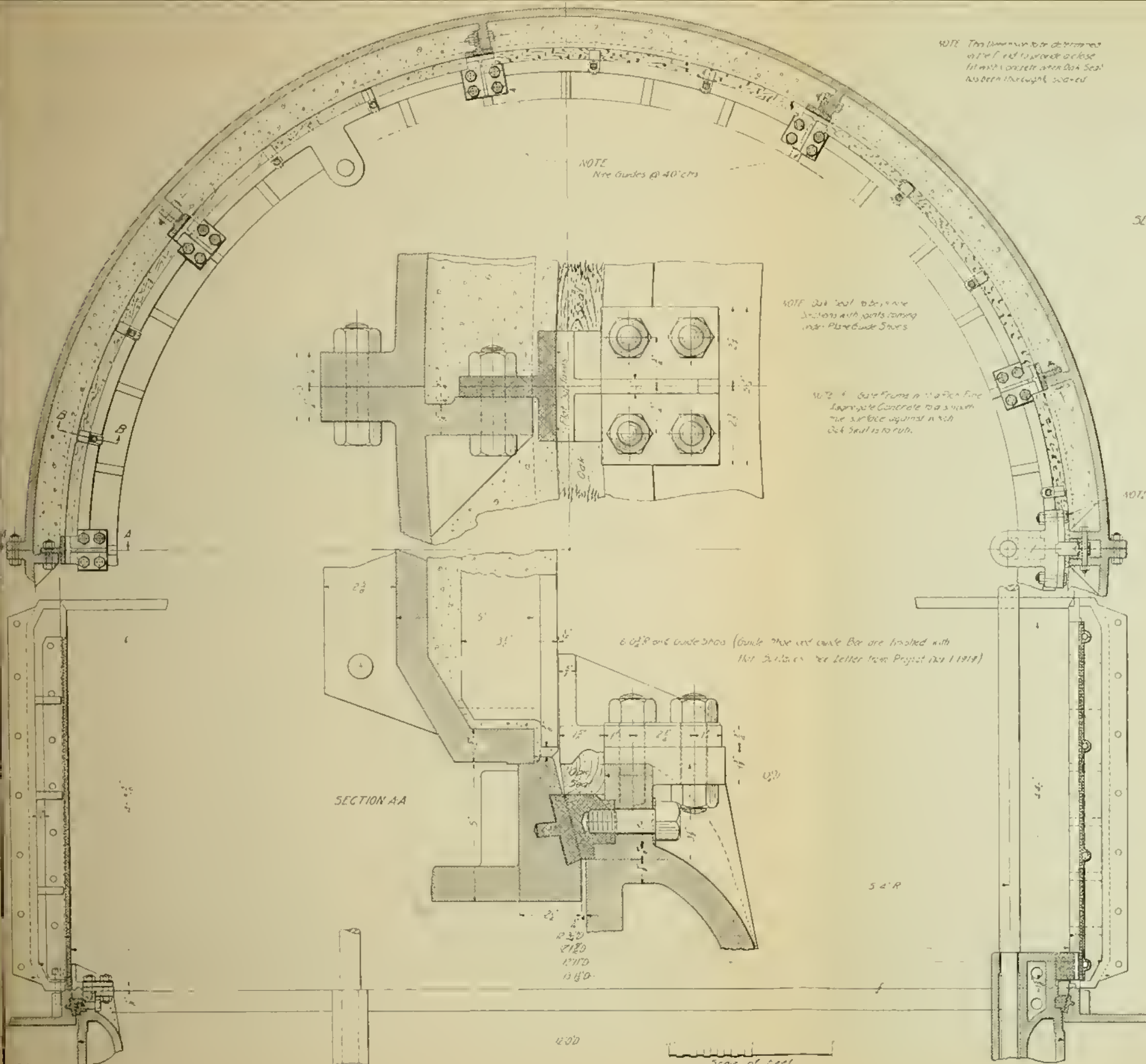


Y A-A

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
FLATHEAD IRRIGATION PROJECT
MONTANA

Mc DONALD LAKES DAM PLAN AND SECTIONS

NO. 20422 PLATE 82 OF 88
1923

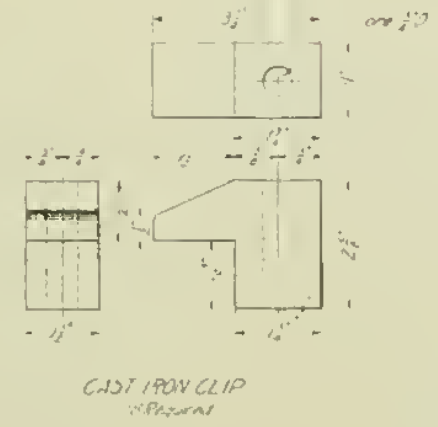
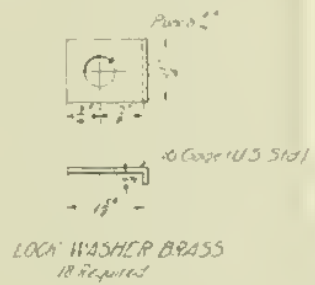
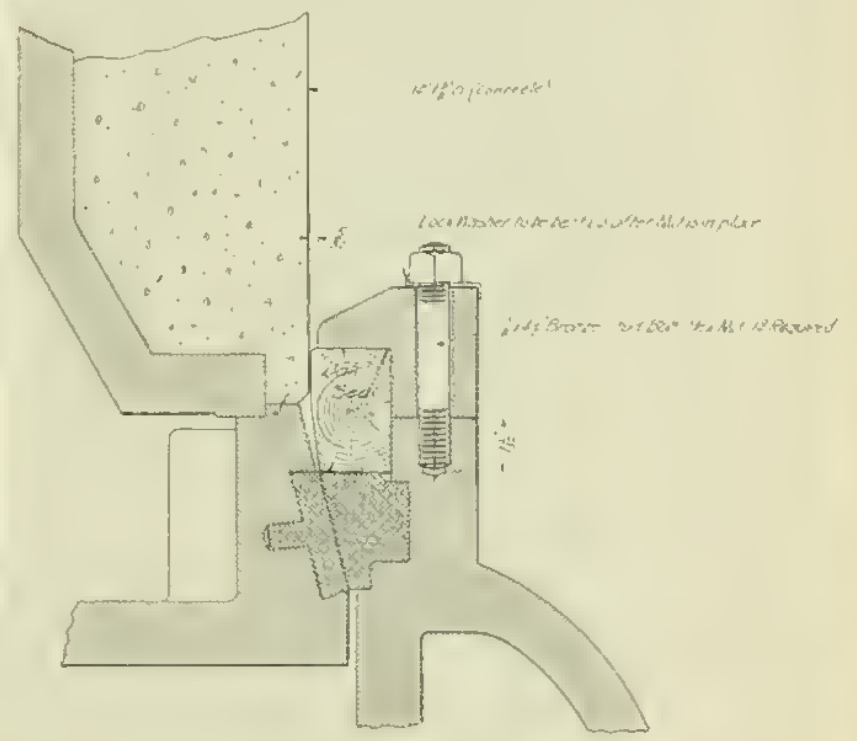
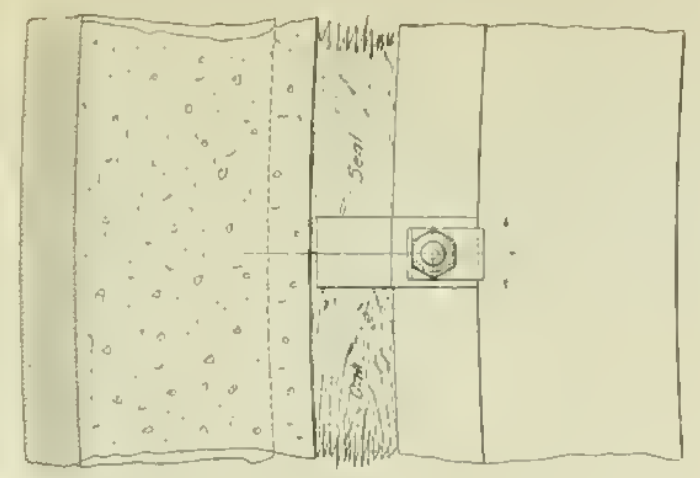


NOTE This drawing is not to be used for the purpose of showing the gate seal in place. It is only a guide to the location of the gate seal.

NOTE New Gaskets @ 40' c/m

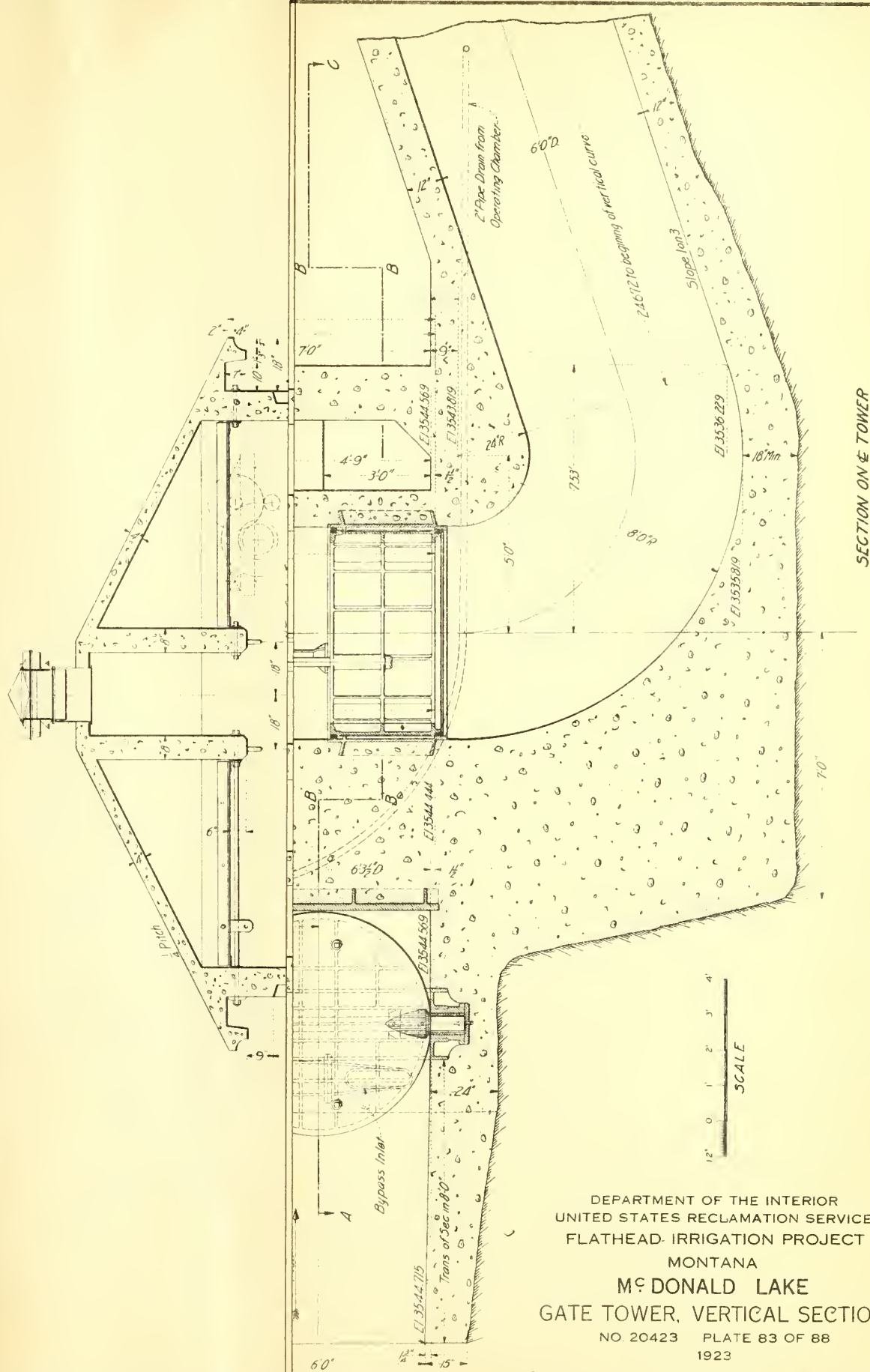
NOTE Oak Seal to be in place. Sections with joints coming into Plate Guide Shoes.

NOTE Oak Seal to be in place. Sections with joints coming into Plate Guide Shoes.

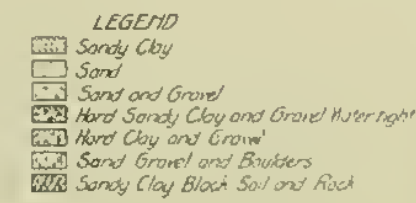
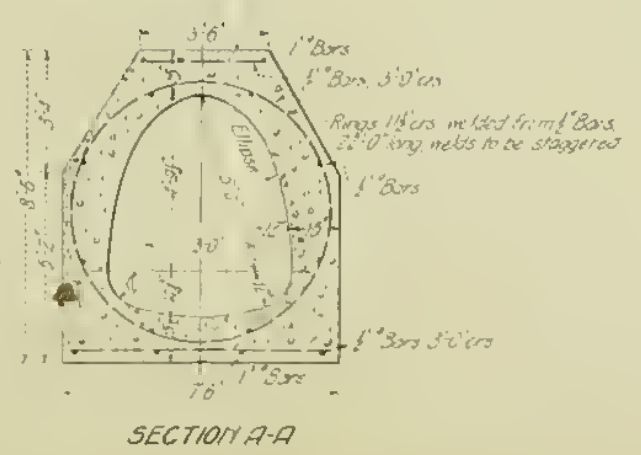
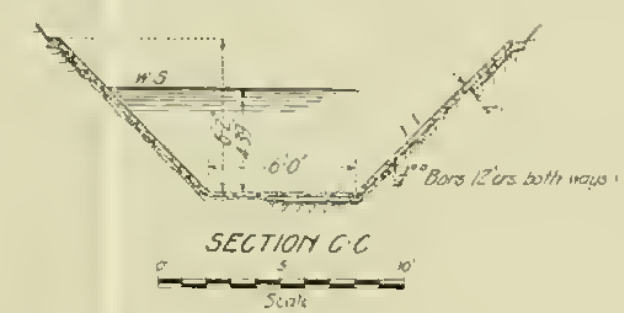
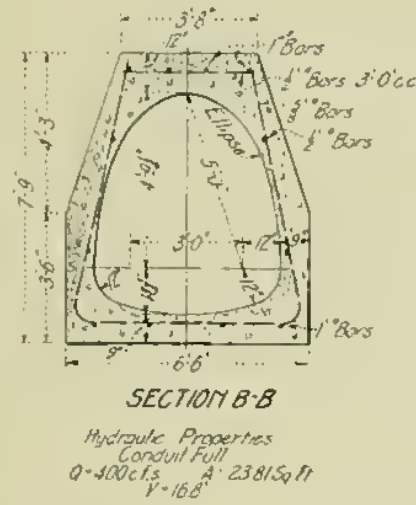
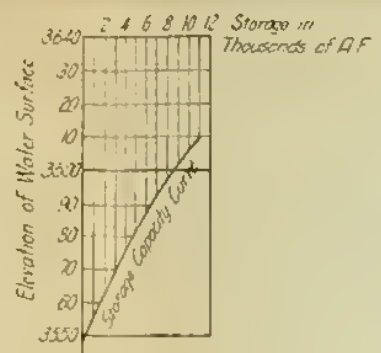


NOTE: The drawing is not to be used for the purpose of showing the gate seal in place. It is only a guide to the location of the gate seal.

DEPARTMENT OF THE INTERIOR
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MILK RIVER IRRIGATION PROJECT, MONTANA
SHERBURNE LAKES DAM
CYLINDER GATE REPAIRS
NO 20421 PLATE 81 OF 88
1923



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FLATHEAD IRRIGATION PROJECT
MONTANA
McDONALD LAKE
GATE TOWER, VERTICAL SECTION
NO 20423 PLATE 83 OF 88
1923



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
FLATHEAD IRRIGATION PROJECT
MONTANA
M^C DONALD LAKES DAM
PLAN AND SECTIONS
NO 20422 PLATE 82 OF 88
1923

NOTE-
For Gate House Details see
Drawing No 6-C-51.

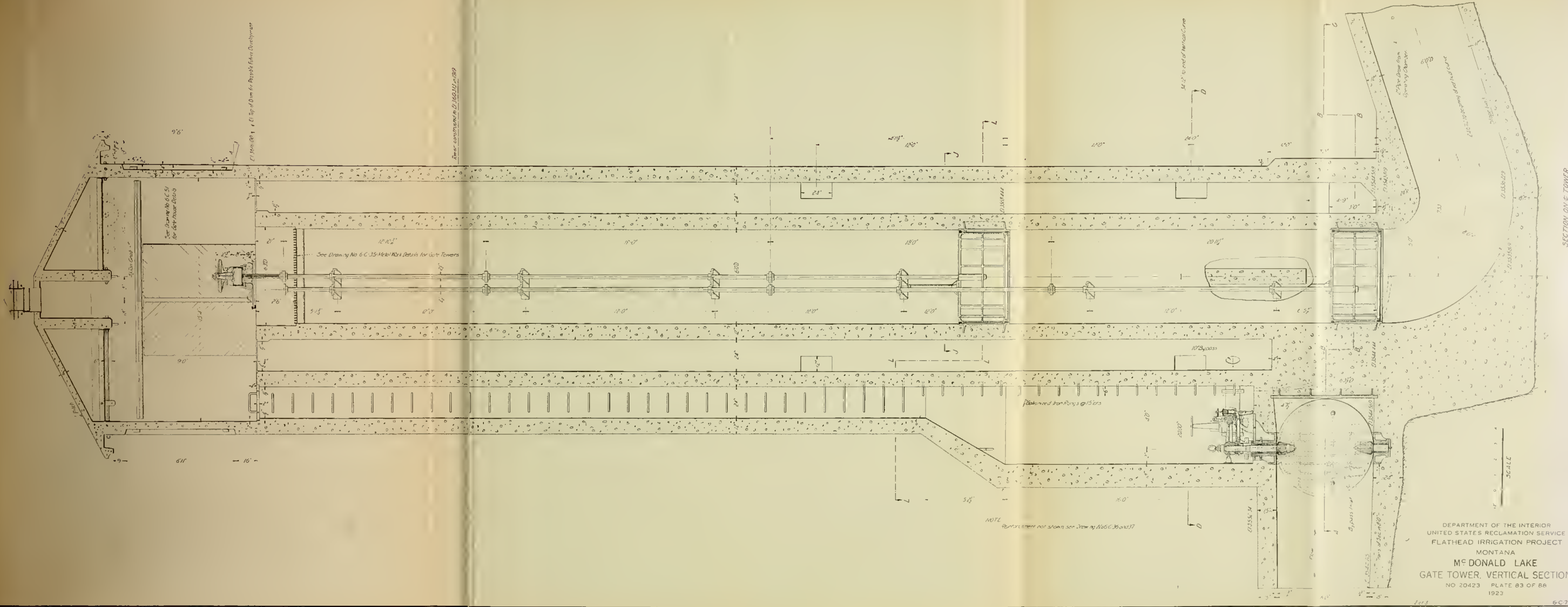
UPSTREAM ELEVATION

SCALE

TRANSITION-TOWER TO CONDUIT

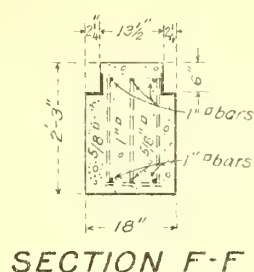
SECTION M-M

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
FLATHEAD IRRIGATION PROJECT, MONTANA
MC DONALD LAKE DAM
GATE TOWER, SECTIONS
NO. 20424 PLATE 84 OF 88
1923

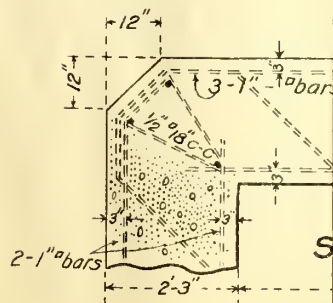
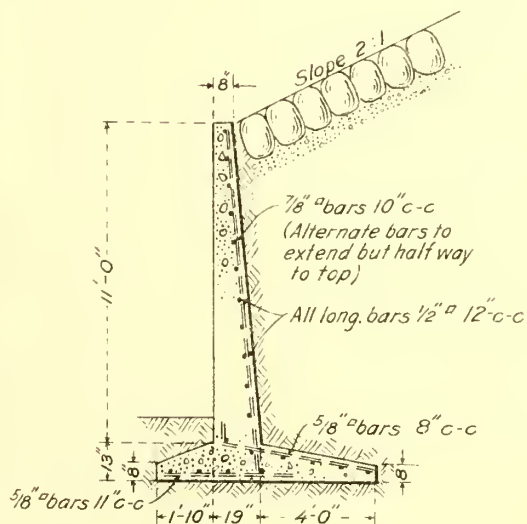
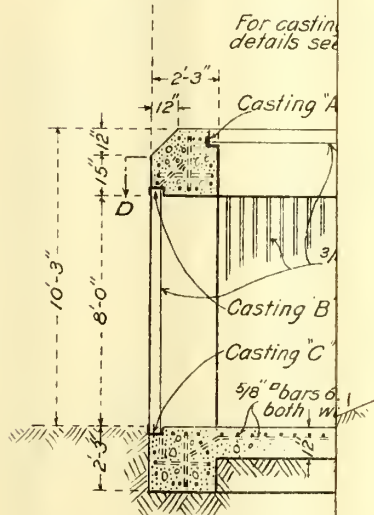


SECTION ON & TOWER

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
FLATHEAD IRRIGATION PROJECT
MONTANA
McDONALD LAKE
GATE TOWER, VERTICAL SECTION
NO 20423 PLATE 83 OF 88
1923
6C-79



Quantities	
Concrete	55 c.y.
1" ^{sq} bars	5000 lbs.
7/8" "	600 "
5/8" "	2300 "
1/2" "	800 "

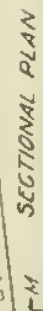
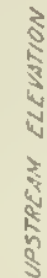
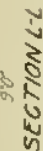
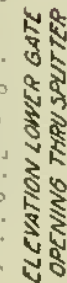
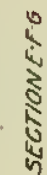
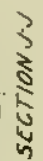
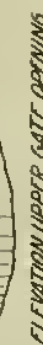
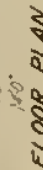


DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
FLATHEAD IRRIGATION PROJECT, MONTANA
MC DONALD LAKE DAM
TRASH RACK STRUCTURE

NO. 20425 PLATE 85 OF 88

1923

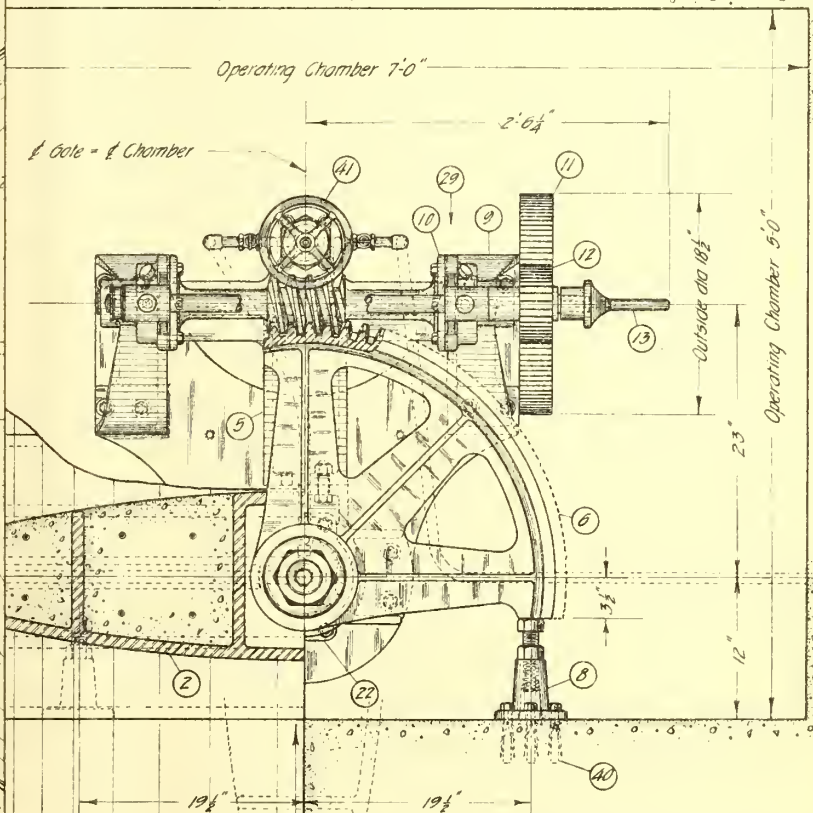
6-C-40



3 of 3

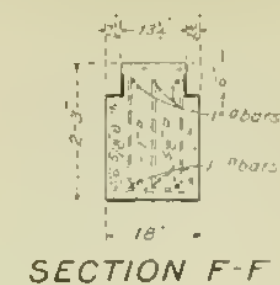
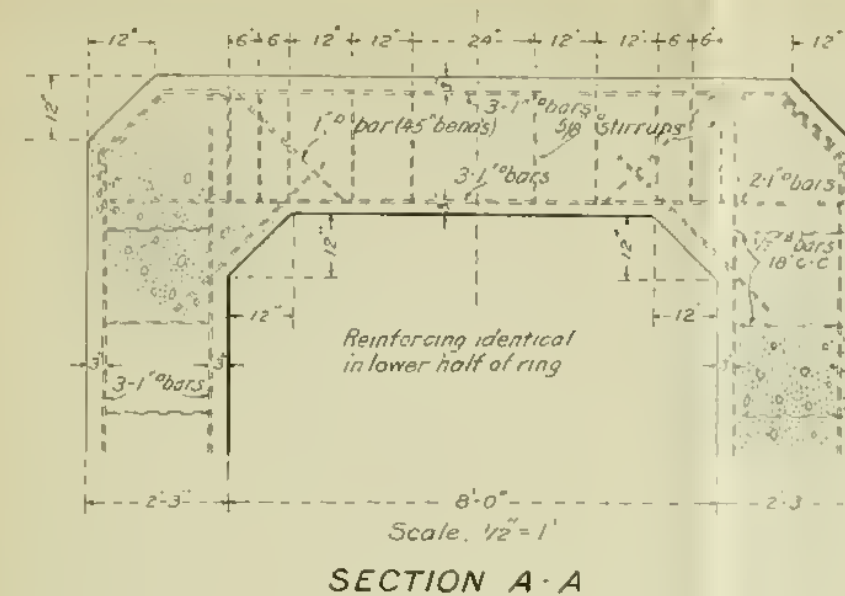
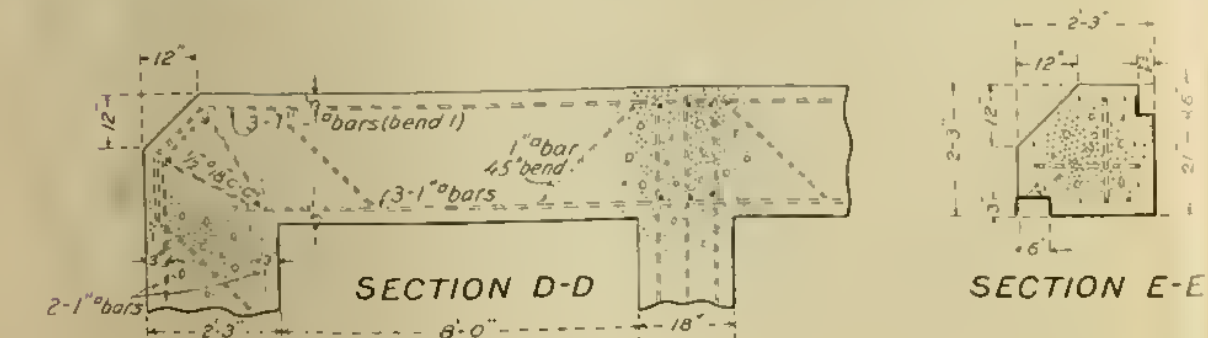
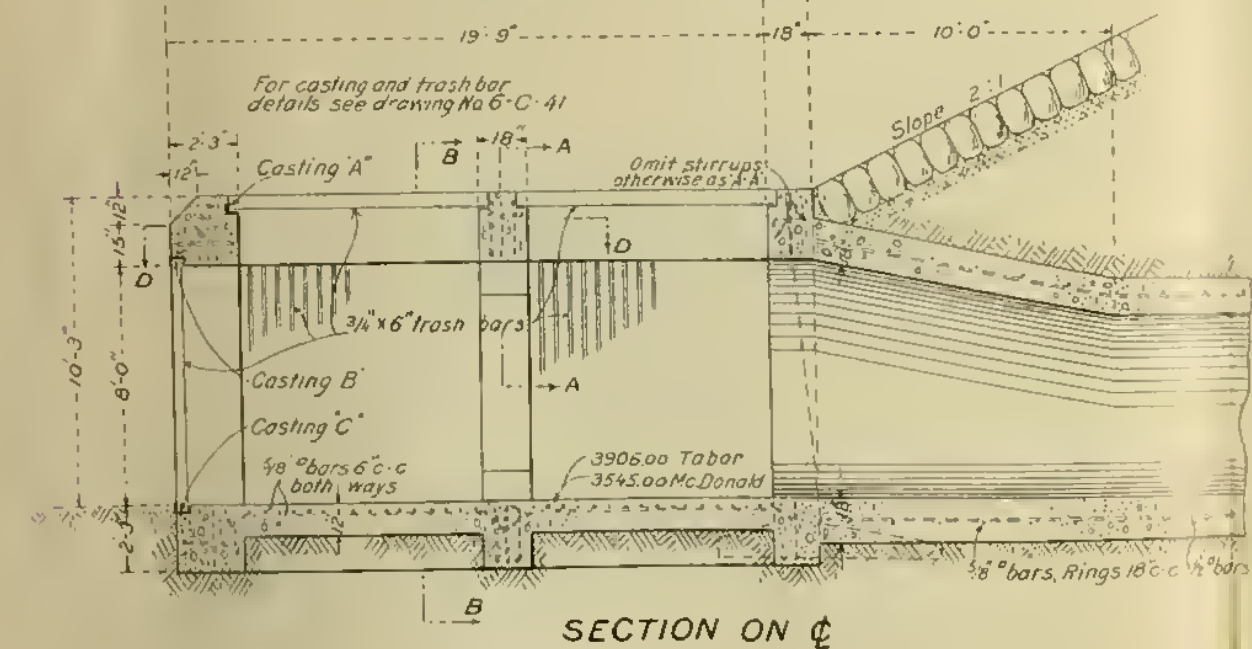
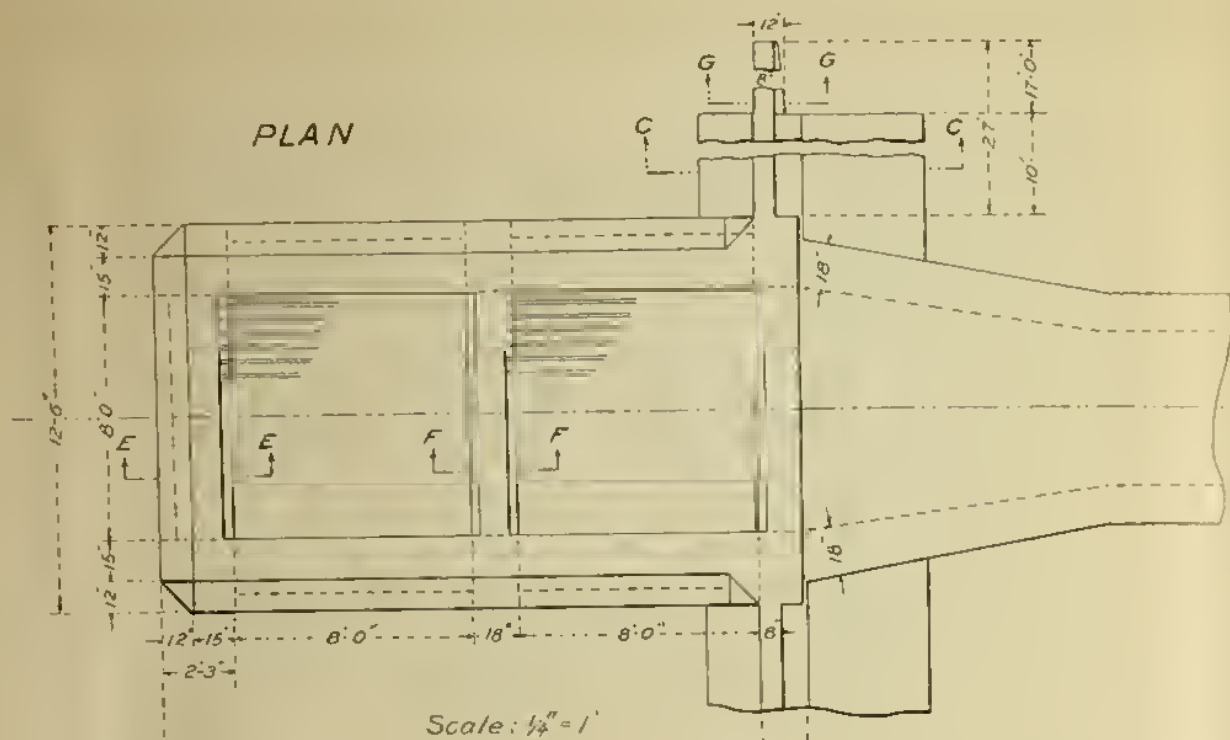
Name	Dring N ^o	Symbol	N ^o Req	Material	Name	Dring N ^o
ase	14E-215	27	28 in. ft.	—	3/4" Square Graphited Flax Packing	not detailed
rol	"	28	1	Steel & Brass	Ball Bearing N ^o 1 complete	14E-216
Cover Plate	"	29	2	" "	" " N ^o 2 "	"
trand	14E-216	30	6	Mild Steel	3/4 x 2 3/4" Cap Screw - Hex head	"
"	"	31	4	" "	3/8 x 2 3/4" " " " "	"
Wheel Sector	14E-217	32	8	" "	3/4 x 2 3/4" " " " "	"
"	14E-215	33	12	" "	1/2 x 1 1/4" " " " "	"
Sector-Complete with ball & nut	14E-217	34	2	" "	2 1/2 x 2 3/4" Machine Bolts " " 8 nut	"
"	14E-216	35	6	" "	3/4 x 2 3/4" " " " "	"
or Ball Bearing N ^o 2	"	36	4	" "	8 x 2 " " " "	"
ar with set screw	"	37	4	John Brasses	3/4 x 6" Stuffing Box Stud-Hex nut	"
with set screw	14E-217	38	1	Mong "	3" Gate Shaft Nut - Hex bossed	14E-215
rank	"	39	1	" "	3" Lock Nut-Hex bossed one side	"
Gate Leaf with Pins Br. Sleeves	14E-215	40	6	Strid	3/8" Expansion Bolts-Hex head	not detailed
Shaft	14E-217	41	1	1 1/4" x Br	Compression Grease Cup - complete	" 13-296
Shaft	"	42	1	Strid	3/4 x 2" Flange Grease Cup-Grane "672 equal	not detailed
Toller with Set Screw - 1 1/2"	"	43	4	" "	1/4 x 1 1/2" " " " "	"
Gate Shaft 3/8" x 1" x 7"	"	44	22 in. ft.	Brass	1/2" Seamless Drawn Pipe - Iron pipe size	"
Worm " 1/2" x 1/2" x 3 3/4"	"	45	1	Flough Brasses	1/2" Y Band	"
Pinion " 1/2" x 1/2" x 3 3/4"	"	46	2	" "	1/2" Stud Steam Lock Grane "258" equal	"
Pin	14E-215	47	2	" "	1/2" Elbow Iron pipe size	"
Box Glands	14E-217	48	1	" "	1/2" Street Elbow " " " "	"
Shing	"	49	2	" "	1/2" Stud Ground Union Grane "521 1/2 equal	"
H - 1 1/2"	"	50	4	" "	1/2" Couplings Iron pipe size	"
Pass Complete	14E-223	51	2	" "	1/2" Elbow 45° " " " "	"
Dushing	14E-217	52	2	Cast Iron	3" Countersunk Pipe Plug	"
"	"	53	4	Brass	1/2" Short Nipples	"

0 : 0 0 0



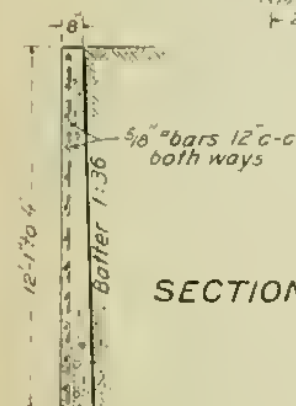
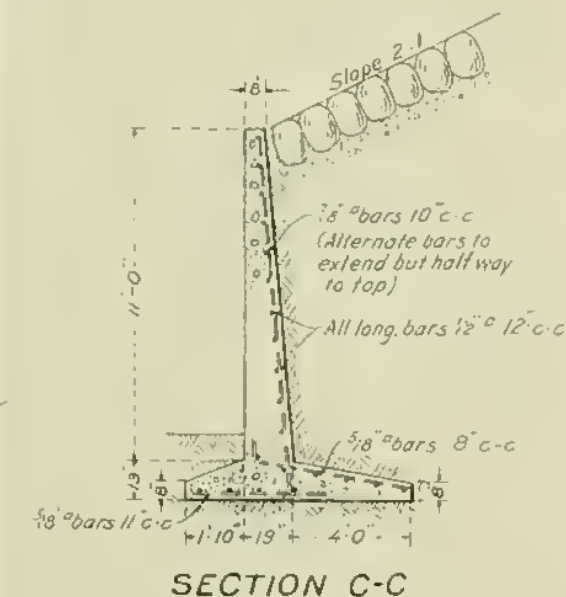
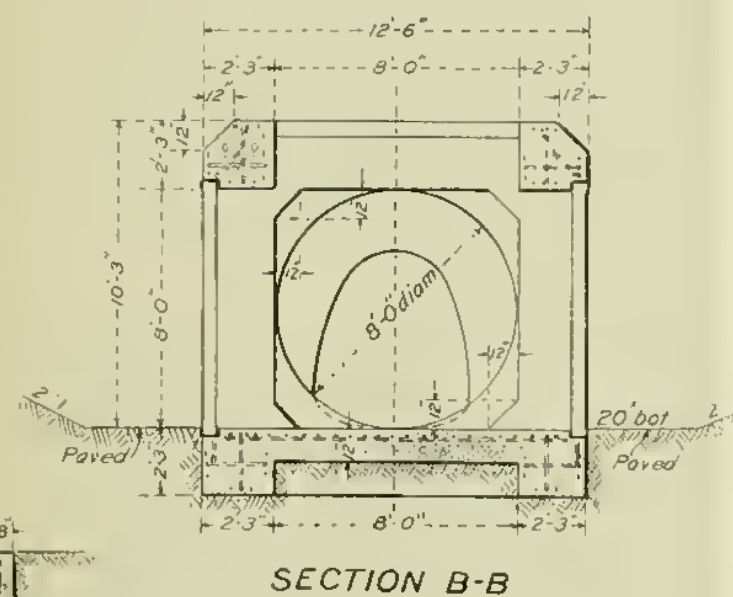
DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
FLATHEAD IRRIGATION PROJECT MONTANA
MC DONALD LAKE DAM
BUTTERFLY GATE ASSEMBLY
NO. 20426 PLATE 86 OF 88
1923

FRONTAL SECTION on ϕ



Quantities

Concrete	55 cy.
1" bars	5000 lbs
5/8"	600
3/8"	2300
1/2"	800

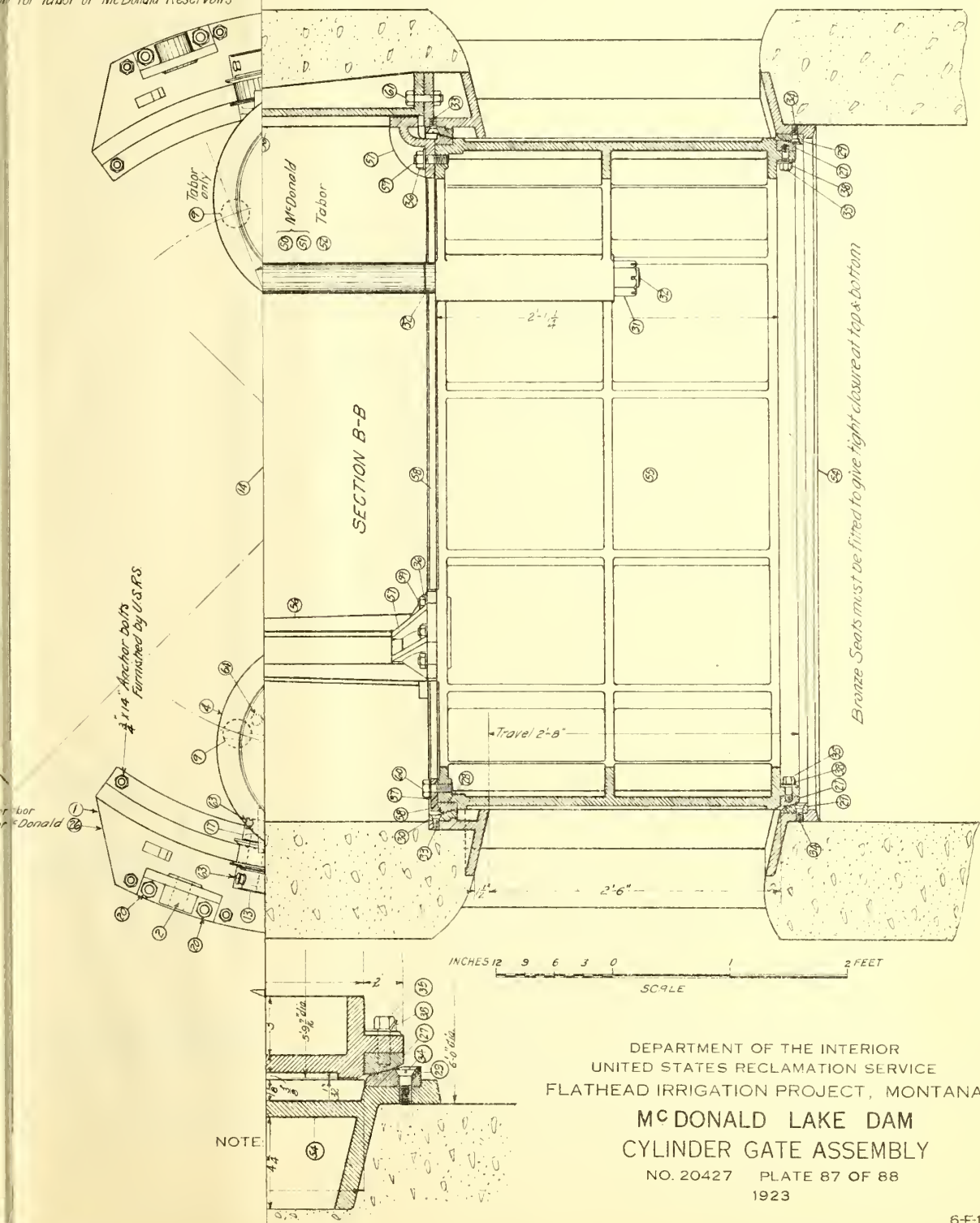


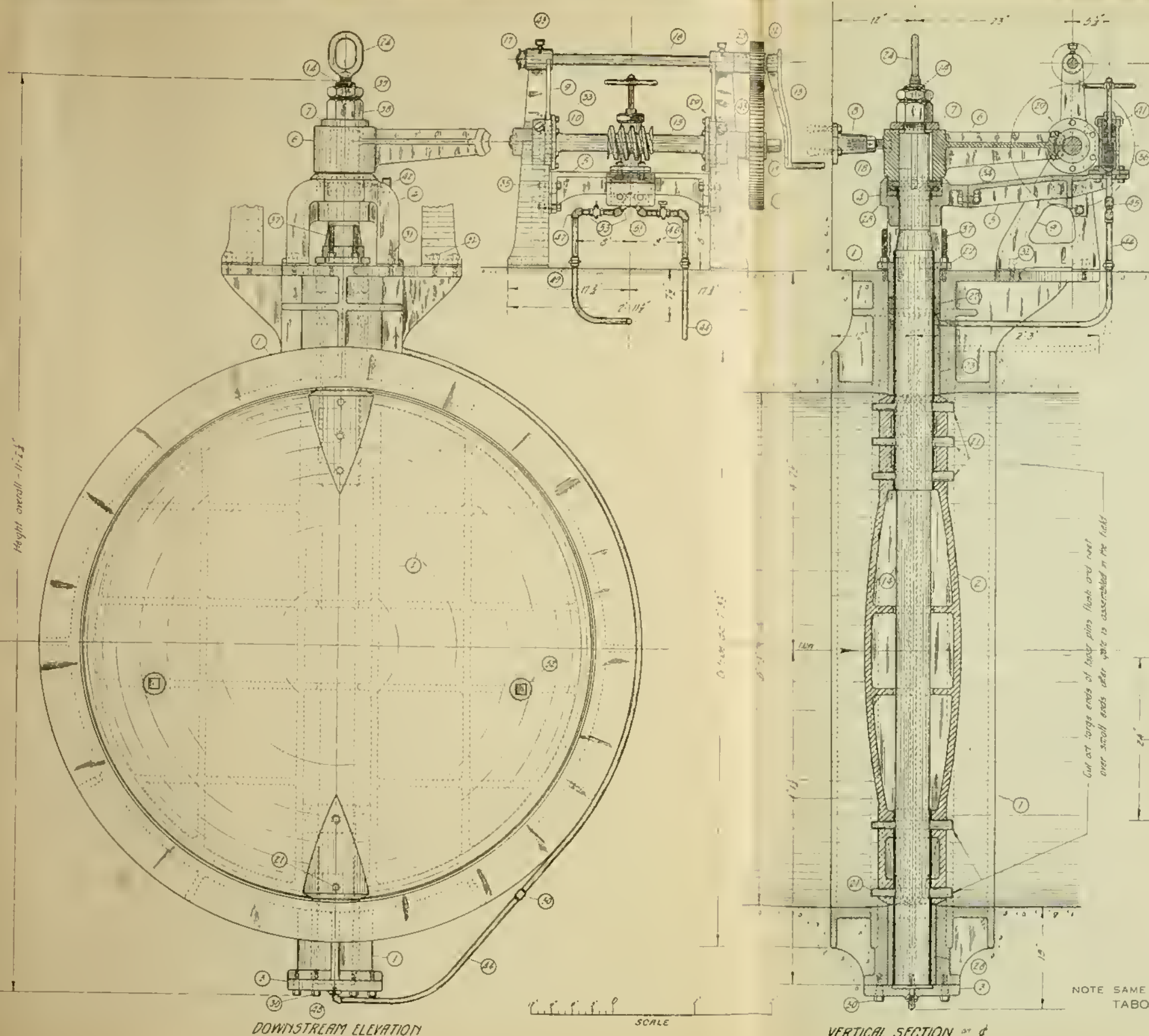
NOTE: SAME DESIGN USED FOR
TABOR DAM

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
FLATHEAD IRRIGATION PROJECT, MONTANA
MC DONALD LAKE DAM
TRASH RACK STRUCTURE
NO 20425 PLATE 85 OF 88
1923

BILL OF MATERIAL REQUIRED FOR TABOR RESERVOIR				MATERIAL REQUIRED FOR McDONALD RESERVOIR					
Mark	No. Req.	Material	Name	Remarks	Mark	No. Req.	Material	Name	Remarks
1	2 or 2	Cast Iron	Bed Plate	With Bed Plate (1) and 6 Taper Pin Bearings (2)	1	1		Hoisting Mechanism	With Bed Plate (1) and 4 Taper Pin Bearings (2)
2	6 or 4	"	Taper Pin Bearings	"	2	2		Gate	"
3	2	Phosphor Bronze	Lifting Nuts	"	3	4	Cast Iron	Single Stem Guide Base	Drwg 14-E-221
4	2	Cast Iron	Bevel Gears	"	4	8	"	Double	"
5	4	"	Pinions	"	5	20	"	Stem Guide	"
6	1	C.R. Shafting	Pinion Shaft	"	6	20	"	Stem Guide Anchor	"
7	2	"	Crank Shafts	"	7	80	Steel	Cap Screws for (3)	"
8	2	Mild Steel	Clamps	"	8	80	"	Bolts and Nuts 1 1/2"	"
9	2	C.R. Shafting	Gate Stem	"	9	6	Steel Pipe	Gate Stem	"
10	2	Cast Iron	Gate Stem	"	10	4	"	"	"
11	4	"	Shaft Bearings	"	11	2	"	"	"
12	2	Hardened Steel	Ball Bearings	"	12	2	"	"	"
13	2	Cast Iron	Wheel Car	"	13	4 or 1	Cast Iron	Stem Flange	"
14	2	Steel	Top Beam	"	14	56	Steel	Bolts and Nuts 1 1/2"	"

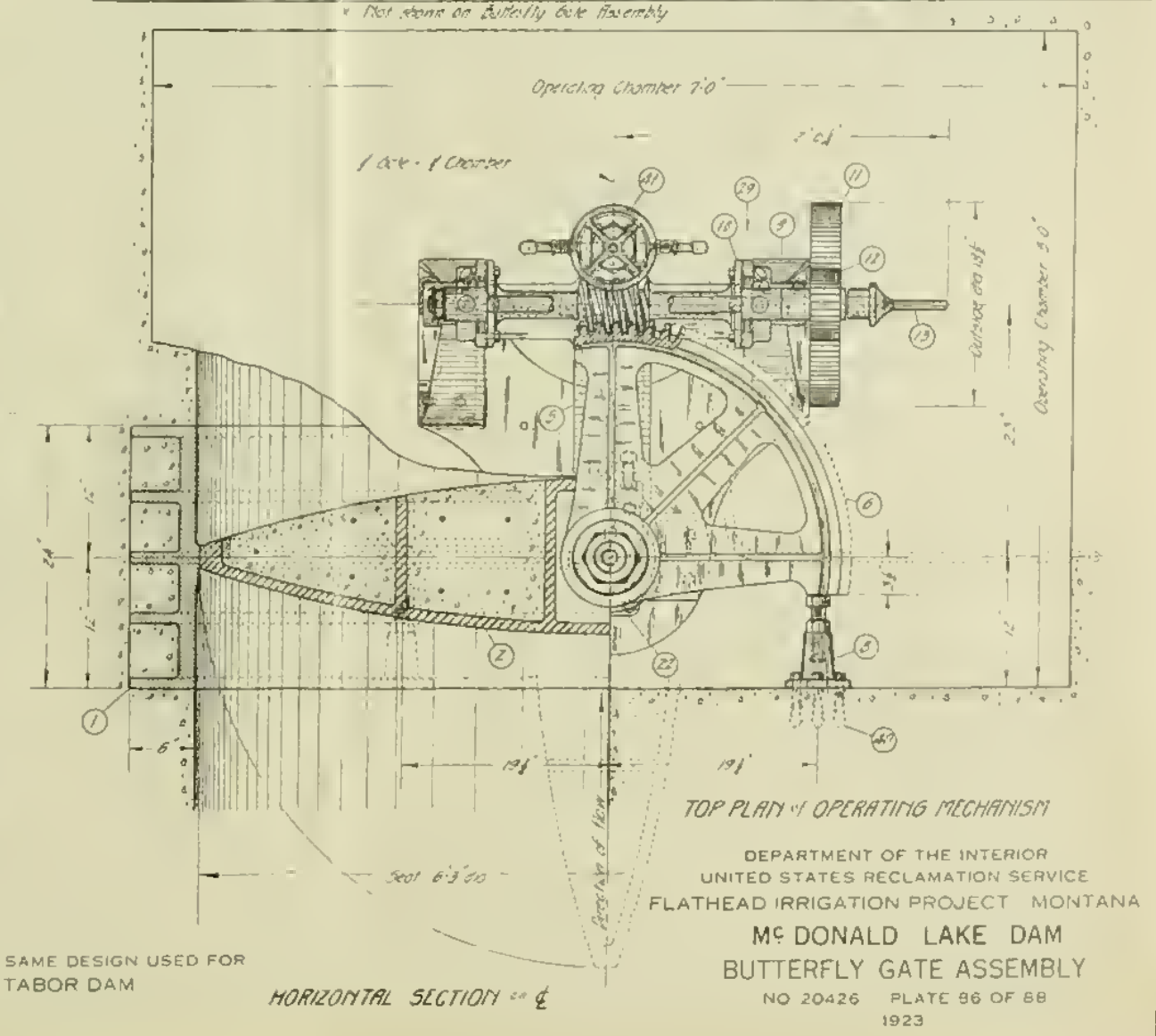
Quantities indicate number
for Tabor or McDonald Reservoirs





BILL OF MATERIAL FOR ONE GATE - TWO WANTED

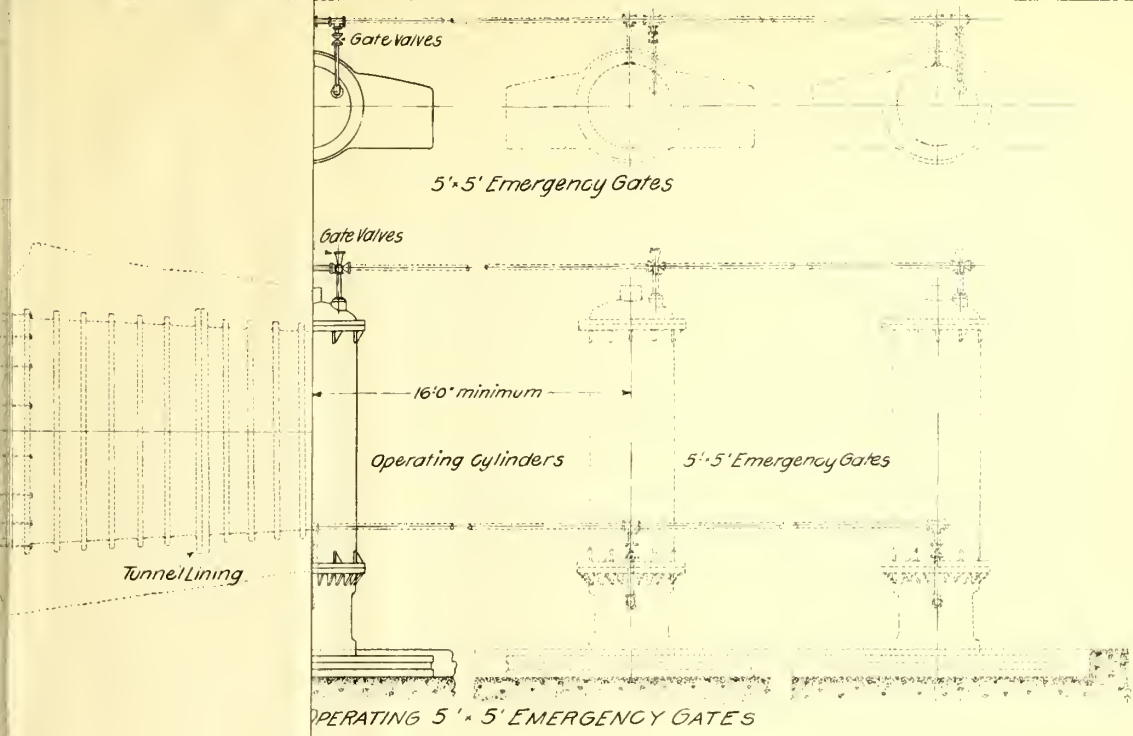
Symbol	Qty Req	Material	Name	Qty	Symbol	Qty Req	Material	Name	Qty
1	1	Cast Iron	Gate Cone	14E 215	27	1/2 in P	3/4" square Carphoid Pipe Packing	14E 215	
2	1	Cast Steel	Gate Leaf	28	1	Small Brass	Roll Bearing 1 1/2" 1" 1/2"	14E 215	
3	1	Cast Iron	Bottom Cover Plate	29	2	1 1/2"	1 1/2"	14E 215	
4	1	Cast Iron	Gate Shaft	14E 215	30	6	Mild Steel	1 1/2" Cap Screw - Hex Head	
5	1	Cast Iron	Yoke	31	2	1 1/2"	1 1/2"	14E 215	
6	1	Cast Steel	Worm Wheel Sector	14E 217	32	8	1 1/2"	1 1/2"	
7	1	Mild Steel	Washer	14E 215	33	12	1 1/2"	1 1/2"	
8	2	Cast Iron	Stop for Sector Complete with Ball & Nut	14E 217	34	8	1 1/2"	Machine Bolts - 8 nos	
9	1/8 in	Brackets		14E 215	35	6	1 1/2"	1 1/2"	
10	2	Cast Iron	Gears & Ball Bearing 1 1/2"	36	4	1 1/2"	1 1/2"	14E 215	
11	1	Cast Iron	Screw Cap with Set Screw	37	2	Small Brass	1 1/2" 6" Shifting Bar Stud Hex Nut	14E 215	
12	1	Cast Iron	Pinion with Set Screw	14E 217	38	1	Brass	1" Gate Stop Nut - Hex Headed	
13	3	Cast Steel	Hand Lock	39	1	1 1/2"	5" Lock Nut - Hex Headed one side	14E 215	
14	1	Cast Steel	Shut the Gate with Pinion & Screw	14E 215	40	6	Steel	5" Expansion Bolts - Hex Head	
15	1	Cast Steel	Worm	14E 217	41	1	1 1/2" 1 1/2"	Compression Groove Cap Complete	
16	1	Cast Steel	Pinion	42	1	Steel	1 1/2" Pin Groove Cap - 1 1/2" 6" 1/2"	14E 215	
17	1	Cast Iron	Safety Lock with Set Screw 1 1/2"	43	2	1 1/2"	1 1/2"	14E 215	
18	2	Mild Steel	Key for Gate Shaft 5/8" 1 1/2"	44	1	1 1/2" 1 1/2"	5" Section Brass Pipe - hex pipe 1 1/2"	14E 215	
19	1	Cast Steel	Worm 5/8" 1 1/2"	45	1	Small Brass	1 1/2" Y Bolt	14E 215	
20	1	Cast Steel	Pinion 5/8" 1 1/2"	46	2	1 1/2"	6" Hex Head Lock Wrench 2 1/2" 1 1/2"	14E 215	
21	5	Brass U-B	Top of 1"	14E 215	47	2	1 1/2"	1 1/2" Hex Pipe 1 1/2"	14E 215
22	1	Brass U-B	Shutting Bar Bolts	14E 217	48	1	1 1/2"	1 1/2" Steel Flange	14E 215
23	1	Cast Steel	Top of 1"	49	2	1 1/2"	5" Steel Hex Head Wrench 2 1/2" 1 1/2"	14E 215	
24	1	Mild Steel	Eye Bolt 1 1/2"	50	4	1 1/2"	5" Carphoid	Hex pipe 1 1/2"	14E 215
25	1	Cast Steel	10" Bypass Complete	14E 223	51	2	1 1/2"	1 1/2" 1 1/2"	14E 215
26	1	Brass U-B	Shutting	14E 217	52	2	Cast Iron	5" Coupling 1 1/2" Pipe Plug	14E 215
				53	4	Brass	5" Short Machine	14E 215	



NOTE SAME DESIGN USED FOR TABOR DAM

HORIZONTAL SECTION

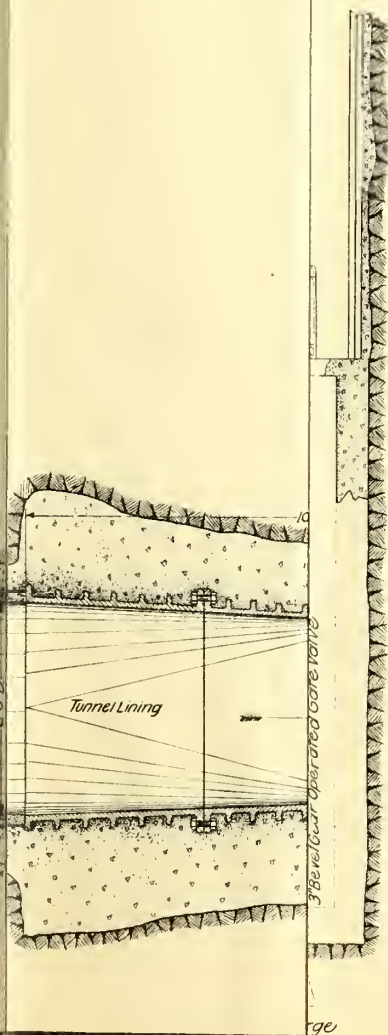
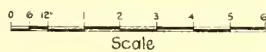
TOP PLAN OF OPERATING MECHANISM
 DEPARTMENT OF THE INTERIOR
 UNITED STATES RECLAMATION SERVICE
 FLATHEAD IRRIGATION PROJECT MONTANA
Mc DONALD LAKE DAM
BUTTERFLY GATE ASSEMBLY
 NO 20426 PLATE 86 OF 88
 1923



HYDRAULIC DATA

Maximum Head on Gate 170ft.

Maximum Capacity 1000 cubic feet per second



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
TYPICAL BALANCED NEEDLE VALVE
INSTALLATION

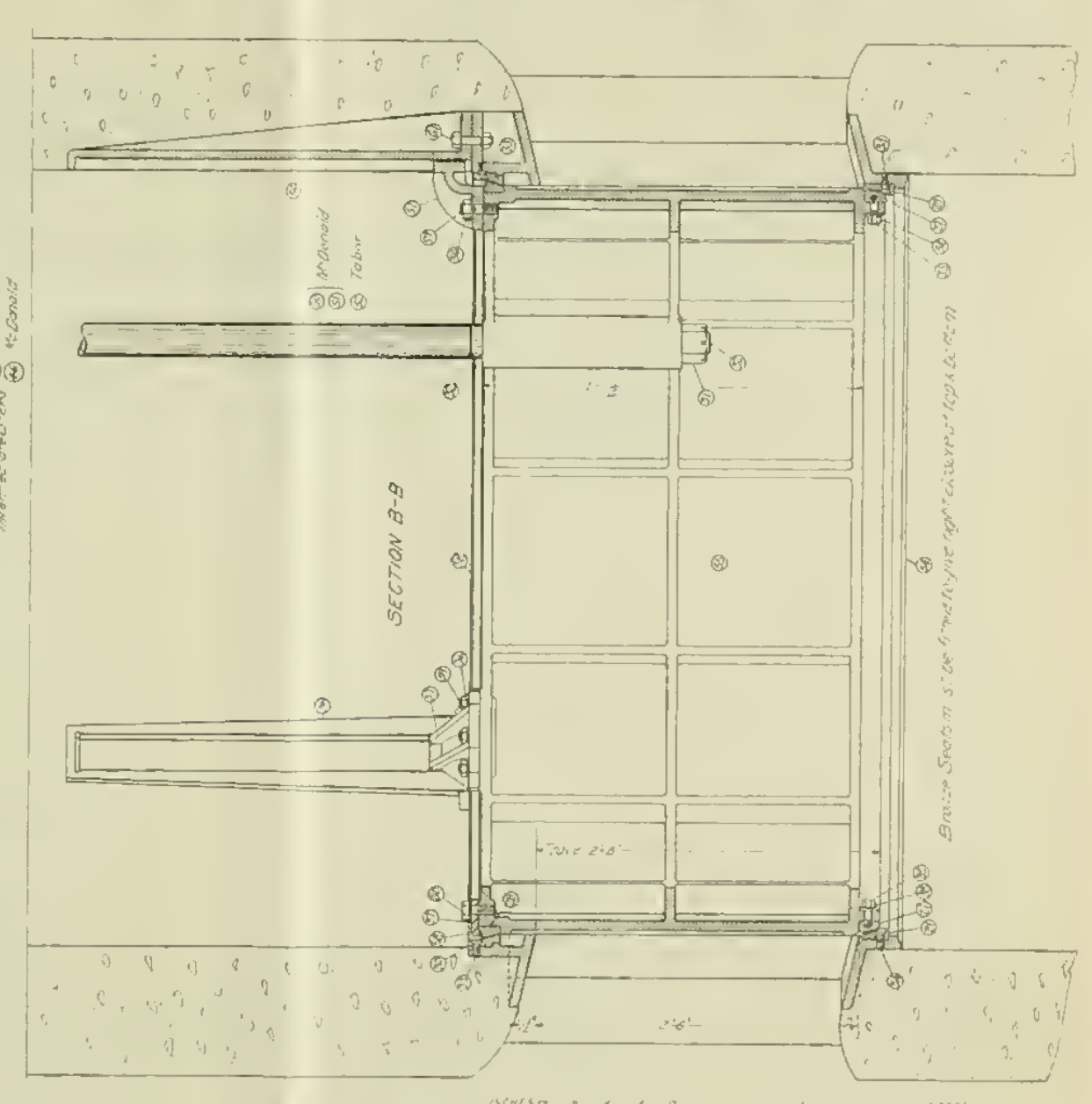
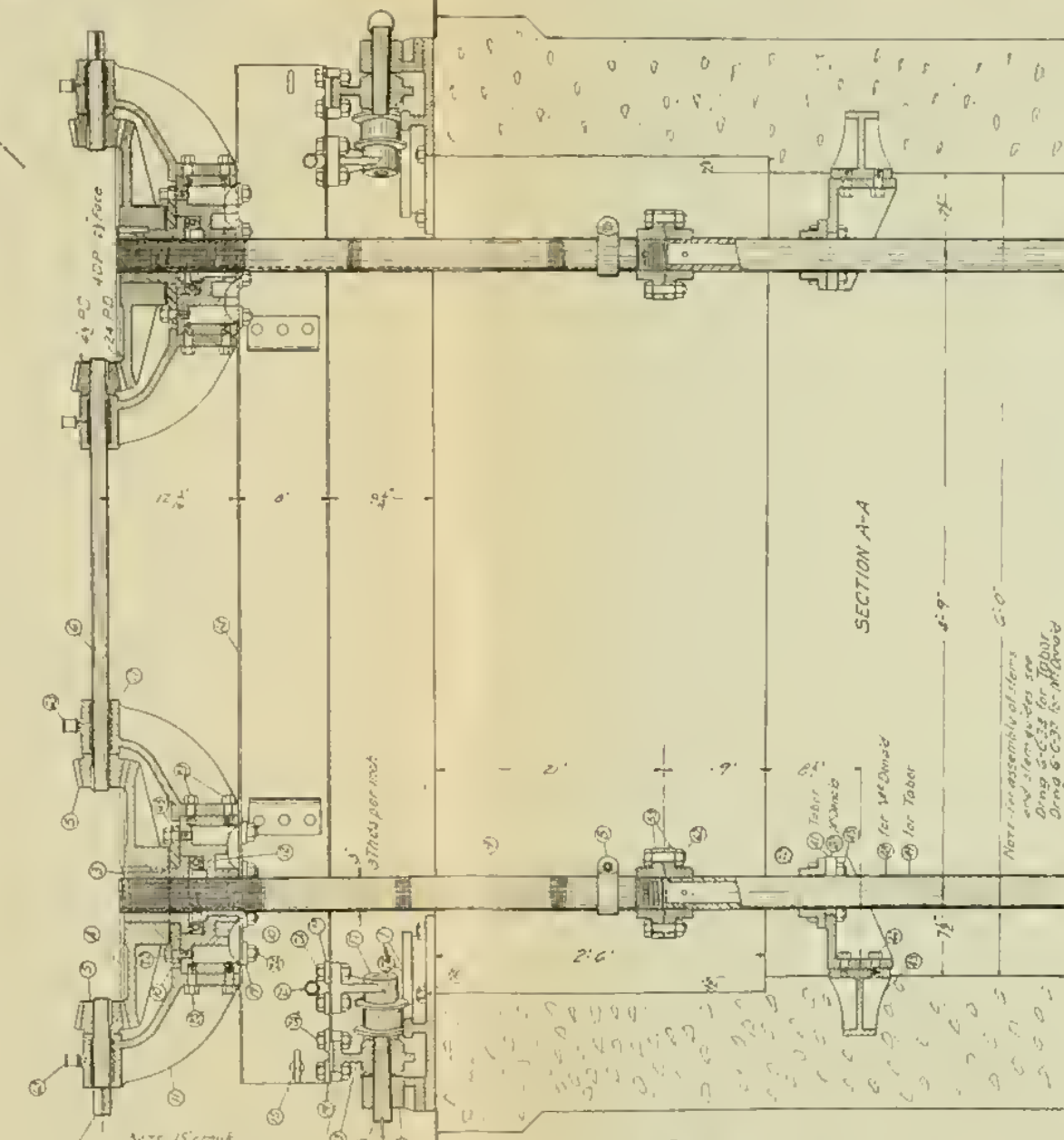
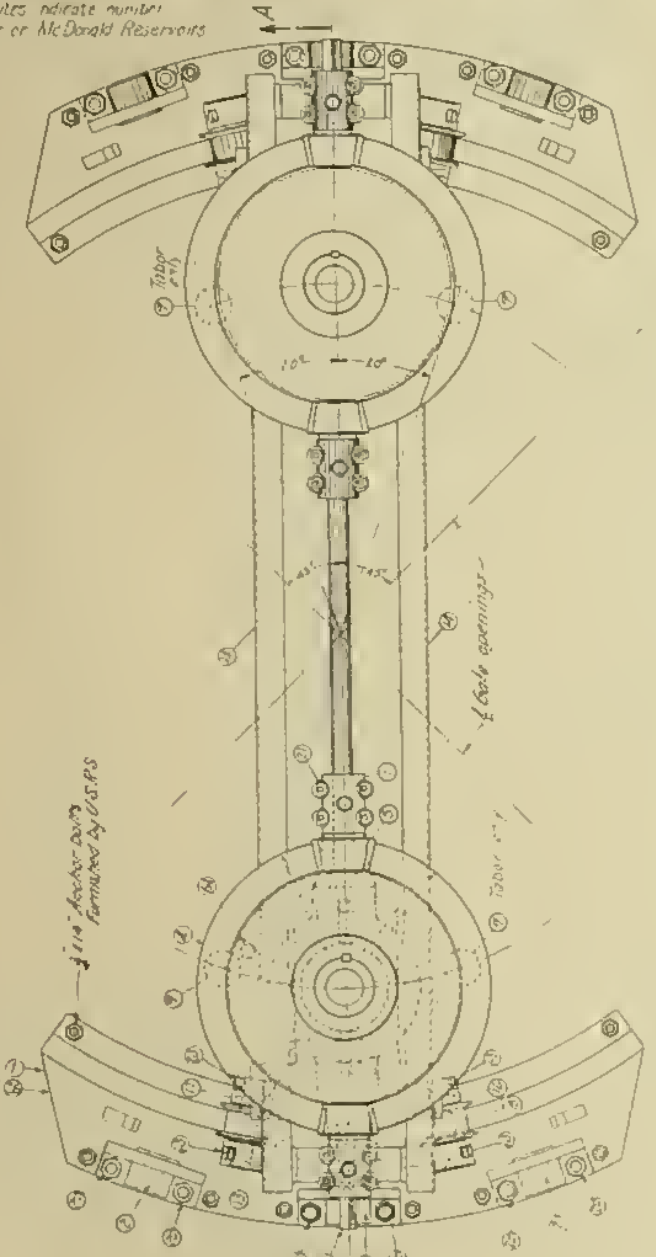
NO. 20428 PLATE 88 OF 88
1923

BILL OF MATERIAL FOR ONE HOISTING MECHANISM									
Mark	No. Pcs	Material	Name	Remarks	Mark	No. Pcs	Material	Name	Remarks
1	2	Cast Iron	Bed Plate	Drwg 14-E-220	1	2	Steel	Upper Pinion Gear	
2	2	Cast Iron	Lower Pin Bearing		2	2	Cast Iron	Wheel Bearing	
3	2	Phosphor Bronze	Lifting Nuts		3	2	Steel	Wheels	
4	2	Cast Iron	Seal Gears		4	2	Steel	Beveled Washers	
5	2	CR Shafting	Pinions		5	2	Steel	Studs	
6	2	CR Shafting	Pinion Shaft		6	2	Steel	Bolt	
7	2	CR Shafting	Cranks		7	2	Steel	Cap Screws	
8	2	CR Shafting	Clamps		8	2	Steel	1/2 and Nuts	
9	2	CR Shafting	Gate Stems		9	2	Steel	Grease Cup Bolt	
10	2	Cast Iron	Gate Stands		10	2	Steel	Gate Stand Flange	
11	2	Cast Iron	Shaft Bearings		11	2	Steel		
12	2	Hardened Steel	Ball Bearings		12	2	Steel		
13	2	Cast Iron	Wheel Carriages		13	2	Steel		
14	2	Steel	Top Beams		14	2	Steel		

BILL OF MATERIAL FOR ONE GATE									
Mark	No. Pcs	Material	Name	Remarks	Mark	No. Pcs	Material	Name	Remarks
1	1	Mang. Bronze	Seat Ring	Drwg 14-E-221	1	1	Brass	Lock Washer	Drwg 14-E-222
2	1	Steel	Gate Lifting		2	1	Cast Iron	Gate Lifting	Drwg 14-E-222
3	1	Steel	Gate Cylinder		3	1	Steel	Gate Guide	
4	1	Steel	Gate Bracket		4	1	Steel	Clamping Ring	
5	1	Steel	Slide		5	1	Steel	Cap Screws	
6	1	Steel	Cap Screws		6	1	Steel	Bolt and Nut	

BILL OF MATERIAL FOR TABOR RESERVOIR									
Mark	No. Pcs	Material	Name	Remarks	Mark	No. Pcs	Material	Name	Remarks
1	1	Steel	Gate		1	1	Steel	Gate	
2	1	Steel	Gate Stem		2	1	Steel	Gate Stem	
3	1	Steel	Gate Guide		3	1	Steel	Gate Guide	
4	1	Steel	Gate Bracket		4	1	Steel	Gate Bracket	
5	1	Steel	Slide		5	1	Steel	Slide	
6	1	Steel	Cap Screws		6	1	Steel	Cap Screws	
7	1	Steel	Bolt and Nut		7	1	Steel	Bolt and Nut	
8	1	Steel	Gate Stem		8	1	Steel	Gate Stem	
9	1	Steel	Gate Guide		9	1	Steel	Gate Guide	
10	1	Steel	Gate Bracket		10	1	Steel	Gate Bracket	
11	1	Steel	Slide		11	1	Steel	Slide	
12	1	Steel	Cap Screws		12	1	Steel	Cap Screws	
13	1	Steel	Bolt and Nut		13	1	Steel	Bolt and Nut	
14	1	Steel	Gate Stem		14	1	Steel	Gate Stem	
15	1	Steel	Gate Guide		15	1	Steel	Gate Guide	
16	1	Steel	Gate Bracket		16	1	Steel	Gate Bracket	
17	1	Steel	Slide		17	1	Steel	Slide	
18	1	Steel	Cap Screws		18	1	Steel	Cap Screws	
19	1	Steel	Bolt and Nut		19	1	Steel	Bolt and Nut	
20	1	Steel	Gate Stem		20	1	Steel	Gate Stem	
21	1	Steel	Gate Guide		21	1	Steel	Gate Guide	
22	1	Steel	Gate Bracket		22	1	Steel	Gate Bracket	
23	1	Steel	Slide		23	1	Steel	Slide	
24	1	Steel	Cap Screws		24	1	Steel	Cap Screws	
25	1	Steel	Bolt and Nut		25	1	Steel	Bolt and Nut	
26	1	Steel	Gate Stem		26	1	Steel	Gate Stem	
27	1	Steel	Gate Guide		27	1	Steel	Gate Guide	
28	1	Steel	Gate Bracket		28	1	Steel	Gate Bracket	
29	1	Steel	Slide		29	1	Steel	Slide	
30	1	Steel	Cap Screws		30	1	Steel	Cap Screws	
31	1	Steel	Bolt and Nut		31	1	Steel	Bolt and Nut	
32	1	Steel	Gate Stem		32	1	Steel	Gate Stem	
33	1	Steel	Gate Guide		33	1	Steel	Gate Guide	
34	1	Steel	Gate Bracket		34	1	Steel	Gate Bracket	
35	1	Steel	Slide		35	1	Steel	Slide	
36	1	Steel	Cap Screws		36	1	Steel	Cap Screws	
37	1	Steel	Bolt and Nut		37	1	Steel	Bolt and Nut	
38	1	Steel	Gate Stem		38	1	Steel	Gate Stem	
39	1	Steel	Gate Guide		39	1	Steel	Gate Guide	
40	1	Steel	Gate Bracket		40	1	Steel	Gate Bracket	
41	1	Steel	Slide		41	1	Steel	Slide	
42	1	Steel	Cap Screws		42	1	Steel	Cap Screws	
43	1	Steel	Bolt and Nut		43	1	Steel	Bolt and Nut	
44	1	Steel	Gate Stem		44	1	Steel	Gate Stem	
45	1	Steel	Gate Guide		45	1	Steel	Gate Guide	
46	1	Steel	Gate Bracket		46	1	Steel	Gate Bracket	
47	1	Steel	Slide		47	1	Steel	Slide	
48	1	Steel	Cap Screws		48	1	Steel	Cap Screws	
49	1	Steel	Bolt and Nut		49	1	Steel	Bolt and Nut	
50	1	Steel	Gate Stem		50	1	Steel	Gate Stem	
51	1	Steel	Gate Guide		51	1	Steel	Gate Guide	
52	1	Steel	Gate Bracket		52	1	Steel	Gate Bracket	
53	1	Steel	Slide		53	1	Steel	Slide	
54	1	Steel	Cap Screws		54	1	Steel	Cap Screws	
55	1	Steel	Bolt and Nut		55	1	Steel	Bolt and Nut	
56	1	Steel	Gate Stem		56	1	Steel	Gate Stem	
57	1	Steel	Gate Guide		57	1	Steel	Gate Guide	
58	1	Steel	Gate Bracket		58	1	Steel	Gate Bracket	
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60	1	Steel	Cap Screws		60	1	Steel	Cap Screws	
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81	1	Steel	Gate Guide		81	1	Steel	Gate Guide	
82	1	Steel	Gate Bracket		82	1	Steel	Gate Bracket	
83	1	Steel	Slide		83	1	Steel	Slide	
84	1	Steel	Cap Screws		84	1	Steel	Cap Screws	
85	1	Steel	Bolt and Nut		85	1	Steel	Bolt and Nut	
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91	1	Steel	Bolt and Nut		91	1	Steel	Bolt and Nut	
92	1	Steel	Gate Stem		92	1	Steel	Gate Stem	
93	1	Steel	Gate Guide		93	1	Steel	Gate Guide	
94	1	Steel	Gate Bracket		94	1	Steel	Gate Bracket	
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96	1	Steel	Cap Screws		96	1	Steel	Cap Screws	
97	1	Steel	Bolt and Nut		97	1	Steel	Bolt and Nut	
98	1	Steel	Gate Stem		98	1	Steel	Gate Stem	
99	1	Steel	Gate Guide		99	1	Steel	Gate Guide	
100	1	Steel	Gate Bracket		100	1	Steel	Gate Bracket	

The different quantities indicate number required for Tabor or McDonald Reservoirs



NOTE: SAME DESIGN USED FOR TABOR DAM

DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
FLATHEAD IRRIGATION PROJECT, MONTANA
MCDONALD LAKE DAM
CYLINDER GATE ASSEMBLY
NO 20427 PLATE 87 OF 88
1923



